

AMATEUR **RADIO**

OCTOBER 1990

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Antenna
Issue**



THE WIA RADIO AMATEUR'S JOURNAL

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Cover

One concept of a 'portable' antenna for the John Moyle Field Day! This approach solved a problem for the VK1WI team. (For the full story see 'Forward Bias' by Phil Clarke VK1PC AR June '90 p44.) The TH6 antenna belongs to VK1 President Ted Pearce VK1AOP, and is the same one featured atop the Questacon building in AR September 1990 p18. Photo Murray Duffus ex VK1ZMD now VK5HQ.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Sundry Topics

JOTA. Undoubtedly combining, for many, their greatest two interests in one, amateur radio and Scouting, the Jamboree on the Air first took place in October 1958. There had been examples of co-operation between the two movements for a number of years prior to this. A Federal Executive station VK3WIA was operated at a Jamboree in Melbourne as early as 1955 but, by 1958, this ad hoc interest had evolved into an annual event.

Perhaps one might draw a parallel between JOTA and the utilisation of space! Just a year earlier, in October 1957, the Russian Sputnik had become the first man-made object to go into orbit. The development and exploitation of space technology since then has been nothing short of incredible. Perhaps JOTA has

not developed quite so impressively, but it is now a worldwide annual event involving hundreds of thousands of participants. And space technology has been part of this picture in Australia for some years now. Once again, by the co-operation and generosity of the operators of our domestic satellite AUSSAT, JOTA traffic is to be relayed across the continent free of charge, greatly enhancing the communication between States otherwise restricted almost wholly to the HF bands.

A further innovation this year is the introduction of two awards for amateurs and Scouting participants. These are the "Radio Scouting Award" and the "JOTA Award". Full details are given in this month's Awards column.

ACRONYMS. It was recently suggested to me that

one thing which may discourage newcomers to amateur radio from persevering with it in greater depth is the way in which we tend to talk and write in a seemingly incomprehensible "alphabet soup". I was willing to agree that perhaps there might be 100 or so examples, like ALC, TVI or RAOTC, which needed occasional explanation, so I thought I would make a list of such abbreviations from the past two years' AR. After several days work my total was well on the way to 1000, and that was without well-known and listed collections like the Q code! Even after 45 years in amateur radio, and much of it also in professional engineering, I still found some letter groups at whose meaning I could only guess! When we have translated the list into plain English I hope we can find space for it in our annual data issue next February.

ELMER. Still on the theme of attracting (and keeping!) newcomers, we have all, early in our amateur careers, been influenced, advised and encouraged by an older, experienced amateur who could answer at least some of our multitudinous questions. In American tradition he was the "ham on the next block" and he may well have been named Elmer. But there must be thousands of potential amateurs who will never be licensed because there is no Elmer in their area. One of the functions of the WIA must be to fill this gap. Where there is a local radio club there may be no great problem, but in or near all areas there should be someone who can be nominated as the "official Elmer", technically competent and good at public relations.

Any volunteers? Any suggestions? Give it some thought. **ar**

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing Australian Radio Amateurs - Member of the International Amateur Radio Union
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WIA NEWS

COMPILED BY WIA NATIONAL OFFICE STAFF

DOC 71

The small pamphlet issued by DoTC as DOC 71, and which contains the "Licence Conditions and Regulations Applicable to the Amateur Service", was first published in March 1989. An updated version has just been published and, with the co-operation of the Department of Transport and Communications and the Australian Government Publishing Service, this latest copy of DOC 71 is included as an insert to this October 1990 issue of Amateur Radio magazine.

A letter from DoTC advises that there are only minor changes in the revised DOC

71 either reflecting changes which have been negotiated with the WIA or a rewording of existing provisions to clarify their intent.

However, a major improvement is the clarification of the use of repeater cross-linking. The totally inadequate paragraph 45 in the old DOC 71 has been replaced with paragraphs 48 and 49. The new paragraph 49 also shows that at long last DoTC have concluded their months of indecision on the subject and radio amateurs in Australia can now cross-link repeaters in the HF 28.0 to 29.7 MHz band to repeaters in the VHF and

UHF bands.

Other changes include the following. Paragraph 9(c), which was 6(c) in the previous edition, has been revised to state that an amateur station shall not be used "to transmit material relating to industrial, commercial, political, social or religious matters." DoTC apparently found this change necessary "to overcome a regulatory problem that has developed as a result of a deficiency with the existing wording" and this will allow the Department "to better control transmission of material believed to be inappropriate to the hobby of amateur radio".

The new paragraph 12 now specifies the countries which have negotiated Third Party Traffic agreements with Australia.

Paragraph 23 (previously

20) now reduces any possibility of misinterpretation if the paragraph is read in isolation.

The word "network" is now taboo in the reworded paragraph 30 which used to be 27.

The latest issue of DOC 72, "Operating Procedures and Practices Applicable to the Amateur Service" will be included with your copy of the November 1990 issue of Amateur Radio magazine.

Yet another WIA service to members.

1991 Call Book Now Available

After weeks of effort in the Executive Office the 1991 Australian Radio Amateur Call Book is now on sale, bigger, better and more accurate than ever, listing 18,707 Australian amateur stations, 600

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers	Weekly News Broadcasts	1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Ted Pearce Secretary Kim Burrell Treasurer Ken Ray	VK1AP 3.570 MHz VK1AB 2m ch 6950 VK1KEN 70m ch 8525 2000 hrs Sun	(F) \$65.00 (G) \$15.00 (X) \$36.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 889 2417 Fax (02) 833 1525	President Roger Henley Secretary Tim Mills Treasurer David Horstall (Office hours Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZKG 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52.120 SSB 52.525 FM VK2KPU 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sunday) 1261.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) \$58.00 (G) \$147.00 (X) \$33.00
VK3	Victorian Division 38 Taylor St Aahburton VIC 3147 Phone (03) 895 9261	President Jim Linton Secretary Barry Wilton Treasurer Rob Halley Office hours 0900-1600 Tue & Thur	VK3PC 1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, VK3XV 147.225 FM(R) Mt Saw Baw VK3XLZ 146.800 FM(R) Mt St Leonard 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) \$85.00 (G) \$152.00 (X) \$39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Ross Muttelburg Secretary Eddie Fisher Treasurer Eric Fittock	VK4FY 1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.910, 28.400 MHz VK4ABX 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday VK4NEF Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$85.00 (G) \$152.00 (X) \$39.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Rowland Bruce Secretary John McKellar Treasurer Bill Wardrop	VK5OU 1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North VK5AWM (NT) 3.555, 146.500, 0900 hrs Sunday	(F) \$65.00 (G) \$152.00 (X) \$39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Alyn Maschette Secretary John Farnan Treasurer Bruce Hedland - Thomas	VK6KWN 146.700 FM(R) Perth, at 0830 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) \$56.00 (G) \$145.00 (X) \$30.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Tom Allen Secretary Ted Beard Treasurer Peter King	VK7AL 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 VK7EB (VK7RAA), 146.750 (VK7WRN), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$63.00 (G) \$150.00 (X) \$38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcast from VK5 as shown (received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (N) Student (S) Non receipt of AR (X)	Three year membership available to (F) (G) (X) grades at fee x 3 times

Notes: All times are local. All frequencies MHz.

WIA registered SWLs, and pages of essential reference information.

Special thanks are due to John Martin VK3ZJC, who has ensured that the repeater and beacon lists, and the band plans, are the most complete and accurate ever published in a Call Book; to volunteers Jo Harris (the VK2 Division Historian), Brenda Edmonds VK3KT, Bill Rice VK3ABP, and Ron Fisher VK3OM for their sterling work in checking the lists of non-WIA members and correcting as many of the DoTC errors as possible; to Peter Hallgarten VK3AVE from DoTC in Melbourne whose liaison assistance was invaluable; and to Executive Office staff Ann McCurdy, Chris Russell, and Earl Russell (no relation) without whose extra effort and dedication the Call Book could not have been produced.

This new 1991 Call Book will be a big seller. Executive Office stocks of the last Call Book sold out in a matter of weeks, and this edition is expected to sell even more quickly. Don't miss out. Buy your copy of the 1991 Call Book now!

You can purchase the 1991 Call Book from your Divisional Bookshop, or from Dick Smith and other leading book sellers. Recommended retail price is \$11.00. However, if you are a WIA member, you can obtain your copy from your Division for the discount price of \$9.50, plus packing and postage if applicable.

Does Your Radio Club Need Money?

There are several hundred amateur radio clubs in Australia. Are you a member of one? Is your club looking for ways and means to raise money? Well, here is a way that your club can earn some income and help the WIA at the same time.

It's a fair bet that your radio club has a significant proportion of members who are not also members of the WIA. Sign

up these club members for membership of the WIA between 1st October and 31st December 1990 and the WIA will pay your club a recruiting fee of \$5.00 for each new member!

For the purpose of this offer, the definition of a radio club is any club which holds an amateur call sign, whether the club is affiliated with the WIA or not; and a new member is a person who has not been a financial member of the WIA in the 12 months prior to the date of the new application for membership.

If your club does not have a supply of WIA membership application forms, then use the form printed on the back of every Amateur Radio magazine flysheet - even photocopies of that form will suffice.

The application forms must be sent with the membership fees to the Division in which the club lives. In order for the club to receive the \$5.00 recruitment fee for each new member of the WIA they sign up, the club secretary should write, on club letterhead, to the Executive Office of the WIA (PO Box 300, Caulfield South, 3162) with details of the new member. At the end of each month of the offer, a cheque for the total amount of recruitment fees due to the radio club for the month will be forwarded to them.

Funding International Activities

In the past the WIA funded international activities on an ad-hoc basis, facing each new demand as it arose. However, this approach was changed at the 1989 Federal Convention of the WIA. Realising the need to plan better financially, the WIA Federal Council adopted a more formal approach to financing international commitments on behalf of Australian radio amateurs.

The WIA has long had a responsibility to pay dues annually to the International Amateur Radio Union (IARU) Region 3 Association. This

amount, set at 75 cents US per licensed member for the current triennium, is a component of WIA members' Federal membership subscription.

With the additional prospect of having to fund amateur representation on the Australian WARC 92 delegation, the WIA Federal Council decided to group all other international funding commitments into a new component of the Federal membership subscription. Thus was born the \$2 international levy which commenced as a component of the WIA membership fee as from 1st January 1990.

The WIA Federal Council also voted to provide an initial balance in the fund by introducing the levy effectively in 1989, with that "back payment" being paid by the Divisions in a lump sum due by the end of 1990. The Federal Councillors were aware some Divisions had been making financial provisions for WARC for some time and saw this as a means of dedicating those funds nationally.

The funds accumulated from this international levy will assist in paying for a WIA Australian delegation to attend a number of events in the future which will be of significant importance to the amateur radio service in Australia. Such events as the IARU Region 3 conferences, normally held somewhere in South East Asia every three years, and as part of the official Australian government delegation to the next WARC to be held in Spain during 1992.

In order to give some idea of the sums involved, the WIA estimates that there will be a minimum cost of \$11,000 to send each Australian amateur service representative to WARC 92 for thirty days, including accommodating and feeding him at the same hotel as the other members of the Australian government delegation, providing a modest sum for incidentals, and showing the Australian amateur radio flag. Incidentally, note

that there is no mention of recouping the lost earnings of the WIA representative. The duty is one of love for the amateur radio service, and one which may be able to be done during the long service leave of the representative!

The costs to send a delegation of four representatives to the Indonesian IARU Region 3 conference next year will be around \$9000. "Why four?" you might ask. This is very likely the last conference for the WIA international representation team leader, and the opportunity is right to expose three new delegates in the international sphere. This chance was missed in 1988 as the WIA did not have this financial planning system in place at that time.

"Is the WIA observing due economies with members' funds?"

The WIA Executive believes so. Early purchase economy air travel is used wherever possible, entertainment expenses are kept modest, and accommodation is usually arranged at group rates by the host society.

"Are the international representation provisions adequate?" Again, the WIA Executive believes so. The state of the funding provision is reviewed quarterly and Executive continues to manage international representation within current limits.

Bandplanning - The Big Picture

During the work up period for WARC 92 it is worth recalling how band planning is carried out in the "big picture".

International allocations for various users of the radio frequency spectrum are contained in the ITU Radio Regulations. These Radio Regulations are the product of international meetings of ITU members, often called World Administrative Radio Conferences (WARCs). Many Australian amateurs will be familiar with the last major WARC affecting amateur

radio - WARC 79 - although there have been many meetings of nations since then, usually devoted to a specific issue and not making elaborate changes to the Radio Regulations.

For the convenience of the nations spread around the world the surface of the globe is divided into three Regions. Region 1 covers Europe, Africa, the Middle East and Russia; Region 2 covers the Americas; and Region 3 covers the remainder, that is India through South East Asia and Australasia to the mid-Pacific.

A look at the Radio Regulations will find frequency allocations by Region. These are also shown in the Australian document, the Department of Transport and Communications' *"Australian Table of Frequency Allocations - October 1982"*.

Because it is necessary to accommodate a wide range of potential users when drawing up frequency allocations, a system of priorities is used.

First, the *"PRIMARY"* users are designated (some times additional *"Permitted"* users are included), then the *"Secondary"* users are added. Also, as if that is not complicated enough, nations have the right to make local or national allocations provided they do not conflict with the ITU allocations. In fact, they can register these as national footnotes when agreeing with the ITU table before it is published in the Radio Regulations.

Please note that: *"Secondary users shall not cause harmful interference to stations of 'PRIMARY' or 'Permitted' services and cannot claim protection from harmful interference from them."*

What does all this mean to Australian radio amateurs?

Firstly, there are no such things as exclusive bands for any user! They are *"PRIMARY"* allocations and there may, or may not be, *"Secondary"* allocations overlaying them. For example, the 14.00 - 14.25 MHz band has only a *"PRIMARY"* allocation to the

amateur service and amateur satellite service.

"Secondary" allocations vary from Region to Region and nation to nation, so what applies in one part of the world may not apply elsewhere. Take the US 220 MHz band for instance. Australians cannot copy at this distance and it's in our VHF TV allocation anyway.

But what about 80 metres or 40 metres? Yes, the WIA Intruder Watch Co-ordinator correctly reports some fishing boats can use 80 metres provided they are operating in international waters and using assignments their home nation has authorised.

How do we as radio amateurs feel about sharing frequencies?

That is being the *"PRIMARY"* users with other services as *"Secondary"* users; or even being *"Secondary"* users with other services having *"PRIMARY"* user status of the allocation?

Its more common than the average Australian radio

amateur might think? Above 144 MHz Australian amateurs have very little *"PRIMARY"* allocation, yet we manage. Or do we? Is MDS going to be a problem? Is it a problem now?

Planning for the next WARC in 1992 is well on the way. The Australian Preparatory Group (APG) first met back in February this year and one side issue, being studied through its Technical Committee T, is *"sharing"*.

The types of questions being resolved are *"who can coexist with whom"*. The Australian amateur radio service is in the midst of these discussions through the WIA APG members.

Several years ago the WIA saw the sharing problem arising and adopted a policy of seeking small amateur *"PRIMARY"* allocations in shared bands. These bids applied across the UHF and microwave allocations and generally were designed to align with the international amateur satellite segments. These views have been relayed to

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DoTC on each occasion that national band planning issues for those hands have arisen. The most recent occasion was earlier this year when a new draft Australian Spectrum Plan was published for public comment. Remember, these allocations can be made on a national basis because of their short range nature.

Freeloaders

The WIA has frequently emphasised that the privileges and benefits of WIA membership should be available to members only. The WIA is not the only amateur radio organisation holding those views. In the latest issue to hand of "Break-In", the Journal of the New Zealand Association of Radio Transmitters (NZART), a sister society to the WIA, a Policy Statement from the Council expresses strong views on use of Association services by non-members.

To quote: "We cannot stop our non-member brethren enjoying some benefits such as the negotiations the NZART conducts with the licensing authorities, the use of repeaters, and the enjoyment of the benefits which band plans bring. Council is firmly of the view that it is unfair to those who do pay their subscriptions if the lot of the non-member is made easier by the ready availability of members' privileges which the Association is, in fact, able to withhold. Further, the NZART has to take into account the feelings of its many voluntary workers, who devote many hours to NZART matters and, in addition, pay their subscriptions as well. These persons have even greater cause to complain if the NZART makes benefits available to non-members who do not contribute to these benefits by at least joining the Association and paying a subscription."

That statement by the NZART applies equally well to the WIA and Australian radio amateurs. How many amateurs do you know who are "freeloading" on you? What are you doing about

them?

One way you can help is by signing up the non-member as a new member of the WIA. Use the application form on the reverse of your Amateur Radio magazine address flysheet.

Amateur Radio Magazine Content

An editorial comment in the latest issue of "Radio Communications", the Journal of the Radio Society of Great Britain (RSGB), emphasises the range of levels on which the magazine must function. Amateur Radio magazine is in a similar position.

Amateur Radio magazine must combine the functions of a scientific journal publishing new articles with that of a newsletter providing information on changes in licensing and operating conditions, while still educating new members on technical and traditional topics and WIA structure. It must also cover the extensive range of interests of a very diverse population.

While Amateur Radio magazine is restricted in space and content by costs and deadlines, the WIA strives to provide for all member interests. Because the content of the magazine is controlled by the range of articles submitted and every effort is made to print all articles received there will, at times, seem to be some imbalance between topics covered. If you, as a reader, feel that some topics or interests are being neglected, perhaps you can help to solve this problem by submitting articles to the editor.

CW as a Licence Requirement

One of the more controversial issues that can be raised among any group of amateurs is the need for CW as a radio amateur licence requirement. When the removal of a CW qualification was mooted a

couple of years ago, the WIA received some very strongly worded comments upholding both viewpoints.

This question is universal. A proposal to the recent IARU Region 1 Conference from the Israel Amateur Radio Club suggested "that IARU Region 1 agree in principle...the CW test for radio amateurs be replaced by some form of operating proficiency test more suitable to the present day data operating modes of amateur radio".

With the forthcoming WARC 92, amateurs may expect to see more proposals to reduce the CW qualifications, or to make other modifications to amateur licence requirements. However, present indications are that the lifting of the Morse Code requirement will not be considered until the next major WARC scheduled for 1998.

The WIA has been considering our current licensing regulations for some time, and is closely monitoring all WARC proposals. It is important to ensure that the uses and benefits of an existing mode are not lost to a communication form that has a much more restricted and/or temporary potential use.

Australian Maritime Museum

"Signals", the Journal of the Australian National Maritime Museum, reports that "One of Australia's best known fighting vessels, 'Krait', has been entrusted to this museum by the Australian War Memorial in Canberra". The article summarises the history of the vessel and notes some of the items of equipment. Of particular interest is the recently acquired radio equipment, comprising an AT5 transmitter, AR8 receiver and antenna coupling unit, complete with handbooks and workshop manuals, all identical to the equipment carried during operation in 1943 and still in operating condition.

Historical Collections

From time to time the Executive Office receives enquiries as to what facilities exist for the custody of historical amateur radio material, both hardware and paper.

The WIA has a Federal Historian, who collects material relating to the history of amateur radio and the evolution of the WIA. The WIA also introduced a scheme to register historical material, but I fear it has not progressed very far.

Most Divisions of the WIA also have an historical officer who is concerned primarily with Divisional historical records.

Beyond these the WIA is aware of the following historical collections, both public and private, which may be worthy of contacting should you be involved in disposing of the estate of a Silent Key.

National amateur radio historical material - Federal Historian C/o Executive Office.

Divisional Historians - C/o Divisional postal addresses.

QSL cards - Ken Matchett VK3TL.

VK1 callign holders, past and present - VK1PJ, C/o VK1 postal address.

VK2 callign holders, past and present - C/o VK2 Divisional Historian.

Historical radio equipment - VK2 Division
Townsville ARC
Telecommunications Museum, Adelaide - contact VK4 Division

Wireless Hill Museum - contact VK6 division

VK7OW
Historical morse keys - VK4SS

Old military radios - Australian War Memorial, Canberra

VK2DYM (see Amateur Radio January 1988 issue)

Victoria Barracks Museum, Paddington, NSW

R A Sigs Museum, Simpson Barracks, Watsonia, VIC

RAAF Museum, RAAF Williams, VIC

RAAF Museum annex, RAAF Townsville, QLD

VK4EF
As you can see there are still gaps in this list. If you are

aware of a collector who has been missed please notify the Executive Office and the information will be added to the list. Remember, the aim of this activity is to compile a list of collections to assist in preserving some of the Australian amateur radio historical past for future generations.

Corporate Planning - An Update

In the April 1989 issue of Amateur Radio magazine the WIA provided an overview of its corporate planning endeavours. You will recall identification of the WIA "mission statement" which is:

"To promote and advance amateur radio locally, nationally and internationally in a way which:

** Meets member and community needs;*

** Encourages the maintenance of standards; and*

** Positions this organisation as the representative voice of amateur radio enthusiasts in Australia."*

Also listed, in some detail, were the five most important issues together with information on what the WIA was doing about them. Since that time not much has been publicised about corporate planning. Nevertheless the WIA has continued to make progress, even if it has appeared slow at times.

One of the inputs, which was connected with several important planning issues, was who provides what services for whom. This matter needed clarifying, firstly by defining what members services were provided, then by determining who provided them. All very simple you might think. However, the WIA historically created Divisional structure, based on the Australian system of Federation, has shown up seven sets of Divisional services in addition to those provided by the Federal Body through the Executive Office.

To further add difficulties to this task, not all Divisions were in agreement as to what services the Executive Office should provide on their behalf. It seems years ago that certain obvious functions were

formally tasked upon the Executive Office, such as the central membership system, the call book entries and Amateur Radio magazine; others were added informally as time went by, and still others were picked up by the Executive Office with its regular staffing, in an endeavour to improve the, at times, tarnished image of the WIA as a membership service organisation.

Quite naturally most Divisions, with predominantly volunteer workers, were happy to let this occur as it saved them effort. However, the crunch came when Executive Office savings had to be made to remain within budget and a fresh look was needed at who rendered which services. The base vehicle for this re-look was the 1988 members services survey, which gave a framework of services and members views on them.

Building on that survey, Divisions are now deciding which services they will DIRECT the Executive Office to provide (and fund them accordingly), and those services which they WILL provide themselves and which they MAY provide now or in the future. The outcome will be a resolution by Federal Council, which will provide a degree of planning stability for the next five years and be subject to review after that period.

Divisions, through their Federal Councilors, will accept responsibility to do certain agreed things, Executive Office will be directed to provide certain services and funded accordingly, and members will be made aware of "who does what for whom."

But, what if the Executive Office cannot afford to do all that it has been directed to do by the Council? Well, in the annual budget setting consultations, which will be a major topic of discussion at the meeting to be held on 13th and 14th October this year, where the Executive examines and refines initial proposals provided by the General Manager, these issues will be examined in detail and priorities set according to Divisional wishes. Some of these are fairly obvious, such as main-

MAGPUBS

ANTENNA BOOKS

The ARRL Antenna Handbook 15th Edition	PNX161 \$36.00
Antenna Compendium Volume 1 ARRL	PNX163 \$22.00
Antenna Compendium Volume 2 ARRL	PNX202 \$22.00
Antenna Compendium Volume 2 & IRR PC Book ARRL	PNX204 \$36.00
Antenna Impedance Matching ARRL	PNX257 \$36.00
Yagi Antenna Design ARRL	PNX164 \$30.00
W1FB's Antenna Notebook Doug DeMaw ARRL	PNX179 \$20.00
Novice Antenna Notebook Doug DeMaw ARRL	PNX162 \$16.00
Practical Wire Antennas John D. Hays G3RQJ RSGB	PNX296 \$36.00
HF Antennas I.A. Morse W6RZ RSGB	PNX298 \$36.00
ANTENNAS 2nd Edition John E. Kraus W4LX	PNX299 \$104.00
Antenna Handbook William I. Orr W5SAI & Stuart D. Cowan W2LX	PNX217 \$17.00
Vertical Antenna Handbook William I. Orr W5SAI & Stuart D. Cowan W2LX	PNX220 \$16.00
Beam Antenna Handbook William I. Orr W5SAI & S. D. Cowan W2LX	PNX215 \$16.00
Wire Antennas William I. Orr W5SAI & Stuart D. Cowan W2LX	PNX214 \$17.00
Cubical Quad Antennas William I. Orr W5SAI & S. D. Cowan W2LX	PNX219 \$17.00
The truth about CB Antennas William I. Orr W5SAI & S. D. Cowan W2LX	PNX219 \$17.00
Transmission Line Transformers J. Verick W7FRL New 2nd Ed	PNX154 \$40.00

SATELLITE BOOKS

Oscar Satellite Review Dave Ingram K4TWJ	PNXJ31 \$17.00
Satellite Experimenters Handbook Martin R. Davidoff ARRL	PNX177 \$26.00
Satellite Antology The ARRL	PNX100 \$16.00
AMSAT-NA 5th Space Symposium 1987 AMSAT-ARRL	PNX102 \$17.00
AMSAT-NA 5th Space Symposium 1987 AMSAT-ARRL	PNX109 \$17.00
SPECIAL the 2 books 5th & 6th Symposium	PNX007 \$26.00
Space Almanac Anthony R. Curtis ARRL	PNX299 \$40.00

PACKET RADIO BOOKS

Gateway To Packet Radio Stan Herzog W4LLO 2nd Edition	PNX100 \$24.00
The Packet Users Notebook Buck Rogers WA8RT CO	PNX285 \$16.00
Packet Radio Is Made Easy Buck Rogers WA8RT WJ	PNXJ32 \$23.00
AX.25 Link Layer Protocol ARRL	PNX176 \$16.00
Computer Networking Conferences 1 - 4 1981 to 1985 ARRL	PNX186 \$26.00
Computer Networking Conferences 5th 1986 ARRL	PNX187 \$26.00
Computer Networking Conferences 6th 1987 ARRL	PNX188 \$26.00
Computer Networking Conferences 7th 1988 ARRL	PNX184 \$26.00
Computer Networking Conferences 8th 1989 ARRL	PNX295 \$24.00
SPECIAL - All 5 Books - Conferences 1 to 8	PNX020 \$70.00

VHF/UHF/MICROWAVE

RSGB Microwave Handbook Volume 1 M. W. Dixon G3FHF RSGB	PNX316 \$70.00
VHF-UHF Manual George Jessop G6JF RSGB	PNX267 \$48.00
All about VHF amateur Radio William Orr W5SAI	PNX216 \$17.00
21st Central States VHF Conference 1987 ARRL	PNX173 \$17.00
Mid-Atlantic VHF Conference Oct 1987 ARRL	PNX175 \$17.00
22nd Central States VHF Conference 1988 ARRL	PNX236 \$17.00
23rd Central States VHF Conference 1989 ARRL	PNX174 \$17.00
Microwave Update 1987 Conference ARRL 1987	PNX174 \$17.00
Microwave Update 1988 Conference ARRL 1988	PNX213 \$24.00
Microwave Update 1989 Conference ARRL 1989	PNX230 \$49.00
UHF Compendium Part 1 & 2 Volume 1	PNX261 \$49.00
UHF Compendium Part 3 & 4 Volume 2	PNX261 \$49.00

HANDBOOKS

ARRL 1990 Handbook ARRL Ward Sound	PNX267 \$52.00
The Operating Manual ARRL	PNX168 \$90.00
The ARRL Electronics DATA BOOK ARRL	PNX201 \$24.00
Radio Data Reference Book G.R. Jessop RSGB	PNX189 \$36.00
Radio Communication Handbook 7th Edition RSGB	PNX266 \$96.00
Radio Handbook 2nd Edition William I. Orr W5SAI	PNX244 \$40.00
Motorsola RF Device Data Motorola 5th Edition 2 Book Set	PNX047 \$24.00

MAPS

Prefix Map of the World Radio Publications	PNX294 \$8.00
Prefix Map of North America Radio Publications	PNX295 \$8.00
Radio Amateurs World Atlas Radio Publications	PNX296 \$8.00
Madhead Locator - World Grid Atlas ARRL	PNX107 \$10.00

The above books, plus many more, are available from your WIA Divisional Bookshop. All items are less 10% discount for WIA Members and are plus postage and handling where applicable.

All Prices are Subject To Change With-out NOTICE
If not in stock at your Divisional Bookshop, your order will be taken and filled promptly. Not all publications are available from all Divisions. * Price Changes... -> price Reduced... -> Price Increase

tenance of the membership database system. Company Act actions also rate quite high if the WIA is to avoid troubles with Corporate Affairs.

Some extensions of the membership database must be self funding, such as the Amateur Radio address aspects coming from the Amateur Radio component of subscriptions and the Call Book inputs from sales of that publication. Overseas liaison cannot fall below a certain level, but hopefully this can be sustained with essentially volunteer effort.

One of the more important actions, hinging on our corporate planning, is the review of the structure of the WIA. This was directed by Federal Council back in 1988, and reaffirmed and further detailed in 1989, but regrettably has proceeded only slowly since then. One of the aims of the structural review was to define members services and identify the providers. The WIA will shortly be in a position to complete much of that action.

From that basis the Federal Council wished to identify structures which would provide the desired services with no duplication, at minimum cost, and with minimum confusion to members as to where they should refer to for assistance.

The WIA has learned a lot from its sister societies around the world. Several office bearers have reported how other national associations have often envied our structure compared with theirs, so the WIA must have it correct in some respects!

But, in keeping with similar organisations in Australia, the biggest concern of the WIA is the declining volunteer effort available, despite the supposedly increasing leisure time. What volunteers the WIA does get must work on essential issues or activities, not duplicate what is being done elsewhere, and not be so bogged down with their duties of office as to be unable to "play amateur radio".

In essence the WIA, your society, must do things well and do them more efficiently. The WIA must not "re-invent the wheel" in every Division but rather adapt what is being

done well elsewhere for the collective good of all.

Callsign Suffixes and De-regulation

During the last few weeks there has been a bit of a "kerfuffle" about the allocation of VK2GOD, VK3GOD and VK4GOD callsigns to radio amateurs by DoTC, and then their withdrawal.

After discussion with DoTC the following letter, dated 27th August 1990, and written by David Hunt, the Manager Licensing of DoTC in Canberra, was received by the WIA Executive Office. Although it is a lengthy letter, it is quoted in full. Quite apart from the question of possible censorship of amateur radio callsign suffixes, this letter is interesting because of the encouraging remarks about deregulation of the amateur service.

"I am writing in response to recent concerns from Amateur operators about a decision to withdraw the use of the Amateur callsign suffix 'GOD'. The decision to withdraw this suffix resulted from a complaint from an amateur operator who was offended by the use of the callsign. Because of the complaint an officer of the Department made a judgement to withdraw the use of the suffix.

Notwithstanding the correctness or otherwise of the decision, a much broader principle is involved. In a climate of government deregulation, regulatory authorities are mindful of the extent to which they become involved in the administration of services. There are a number of factors to be considered. When deciding when to be involved and when not to be involved, to a large degree depends on the nature of the service, the administration of the service and the behaviour of the participants within the service. In other words, we need to look at the extent of the rule making process and the capacity for the environment to sustain its own level of self regulation.

The amateur radio service in Australia is one example where there is always scope for review of the level of deregulation the service can sustain. Given the excellent administrative infrastructure that

exists in the amateur service through the State and Federal bodies of the Wireless Institute of Australia, I believe there is considerable scope for further review. We must not lose sight of the fact that many rules are still necessary. Concerning the allocation of suffixes to amateur callsigns, however, the need for the Department to engage in the appropriateness or otherwise of callsign suffixes, ie to apply censorship, is questionable. I have decided therefore, not to remove any of the AAA - ZZZ callsign suffixes from the international allocations for Australia.

The issuing of amateur callsigns happens automatically from the Department's Spectrum Management Information System (SMIS) database. There is also provision for amateurs to request a suffix of their choice. Amateur callsigns consist of both prefixes and suffixes, together. The suffix should not be separated from the callsign and used on its own.

If the Department were to place any restriction on one suffix, then there would be an expectation that other restrictions could be placed on any of the suffixes. It is far better for the Department not to be involved in judgements, in favour or otherwise, of suffixes associated with Amateur callsigns.

In cases where a suffix to a callsign could be interpreted as offensive, then I suggest that the full callsign be announced clearly and precisely, without any separation of the suffix from the prefix. In addition, the Department recommends the use of the phonetic alphabet for the announcement of callsigns to avoid any misinterpretation of callsign suffixes. When announcing callsigns, operators should use all of the allocated callsign, and not shorten the callsign for sake of convenience or to cause offence to others, particularly in circumstances where the suffix could be misinterpreted by others as being offensive.

The Department and the Executive of the Wireless Institute of Australia both recognise the concern expressed by some people about the content of transmissions by the hold-

ers of callsigns using the 'GOD' suffix. The content of transmissions is a separate matter from the allocation of the callsign. Where the content of amateur transmissions is of concern, the Department will consider any representations made from amateur operators.

I trust that this letter explains the Department's position on this matter. All holders of the callsigns in question will have their original allocation restored."

The original holder of the VK3GOD callsign, who is a minister of religion, informed the Executive Office the day after the above letter was received, that VK3GOD had been re-issued to him.

WARC 92

Much has already been publicised about WARC 92, and much more will appear in the run up to the event. Why, you might ask? What is so important about some event that will not take place until 1992 and will be held on the other side of the world?

The following extract from a speech delivered to the recent IARU Region 1 Conference in Europe by Dr Pekka Tarjanne, the Secretary General of the International Telecommunications Union (ITU) should provide an answer.

"These WARC's, especially WARC92, once more challenge amateur radio on the international conference front. Although, by definition, radio amateurs do not have large financial or political resources at their disposal, the activity has survived - and even prospered thanks to the resources of its participants. And it has its 'guardian angels', as every participant in an ITU radio conference knows. Even in conferences where opposing participants are fighting fiercely for every kilohertz for commercial or governmental services, the amateurs present - and there are often many of them among the 'combatants' - will join ranks to protect or improve the amateur services in the bands under consideration. The CCIR includes amateur radio in its studies, publishing updated reports on the technical developments, frequency utilisation of amateur

and amateur satellite service, frequency sharing and interference considerations.

Neither its recognition for public service, nor its guardian angels, add up to a 'carte blanche' for amateur radio in allocation battle. Far from it. During virtually every radio conference the amateur service is threatened, sometimes very seriously. It is the vigilance of radio amateurs everywhere, and national, regional and global leagues that serve as collective voices for the amateur services, that address the pressures on allocations. National amateur organisations have been effective in contributing to national positions for conferences."

Do you want to protect amateur service frequencies from commercial and governmental attack?

You can do so by supporting the WIA, the only body in Australia effectively fighting for the amateur service. Renew your membership promptly when it becomes due. Sign up non-member amateurs as new members at every opportunity.

VHF Comms Still Alive

Following the recent note about the cessation of publication of the quarterly publication "VHF Communications", the Executive Office has received word that the production will be taken over and continued by a newly formed company in England, "KM Publishing", as from the beginning of 1991. Subscribers will be notified as further information is received.

Spinoffs

The editorial of the August 1990 issue of the ARRL publication "QEX" refers to the technological developments from the Amateur Satellite Service, and their applications to engineering and commerce. It also notes a development that may not be wholly desirable.

"There's another (amateur to commercial) spinoff area of interest these days. Many are aware that packet radio technology developed by hams has been used by other radio serv-

ices, commercially and by governments. But there's one, in particular, that not only uses the amateur (AX.25) protocol but does so in the US 902-928 MHz amateur band. That system is known as LAWN, which is a radio local area network operating under the Part 15 provisions for 1 watt spread-spectrum. LAWN is not the only Part 15 spread-spectrum system operating in this band, but is the only one we know of using AX.25. As these spread-spectrum systems are relatively new, we have not received reports of interference from them to amateur operations in the 902-928 MHz band. If there are some, the ARRL Technical Department would appreciate the information.

Whatever emerges from the small satellite initiatives will change the way the world telecommunicates, particularly in less densely populated areas that are not economical for cellular radio. Amateur radio and satellite experimenters can take some pride in their contributions to this field. One has mixed feelings about commercial systems that benefit from Amateur Radio technology and want to operate in our spectrum, however."

Joint WIA/DoTC Meeting

At the Joint WIA/DoTC meeting held in Melbourne on 24th July 1990 the opportunity was taken to review the status of a number of outstanding items. It was agreed that the WIA will receive, in the near future, written confirmation of the status of Reciprocal Licence arrangements and Third Party Traffic bilateral agreements.

Once again, the definition of "Third Party" was discussed. DoTC is prepared to "seek a Third Party view on the matter" by discussing the differences in definitions with the Telecommunications Policy Group. It was agreed that the establishment of club stations in Antarctica would avoid the need for operators to be issued with special licences, and that DoTC will investigate the possibility of

the home addresses of Antarctic operators being made available to the VKO QSL Manager.

The WIA submission on disposals items on WIA news broadcasts has been received by DoTC but is still under consideration. With regard to call signs, arrangements have been made with DoTC offices for the issue of VK9 call signs manually so as to ensure their appropriate sequence, but no change is envisaged in the system of issuing licences to visiting amateurs.

An application for a licence for a Digitised Voice Store Bulletin board has been approved. DoTC agreed to provide the WIA with information, for publication, of all actions taken on Intruders to any part of the spectrum, and assured the meeting that action is being taken on out-of-band transmissions.

There was extensive discussion on the subject of repeaters and repeater linking. The WIA is to prepare a submission on possible relaxation of identification requirements for linked repeaters, and also one on packet radio networking issues.

The progress of devolution of amateur examinations and the monitoring of the new system were discussed in detail. DoTC indicated its intention to have the computer program for compilation of question papers refined, and then to review the question banks. There is no intention to devolve the issuing of Certificates of Proficiency, or the examination of Morse Code at a speed of more than 10 wpm.

The issue of RF tag identification of shipping containers was raised for future consideration. Although few new topics were added to the agenda, the meeting was very useful in clarifying issues that have been on the agenda for extended periods.

More RFI

A publicity leaflet from the State Electricity Commission

of Victoria extols the virtues of a new type of fluorescent lamp which plugs into a normal bayonet socket, consumes less power, and lasts considerably longer than a normal incandescent globe. However, note the last paragraph on the back page.

"Electronic compact fluorescent lamps currently on the market generate higher harmonic distortion and radio interference than do the ferromagnetic type. Therefore, some caution may be required if you operate sensitive electrical equipment (eg: computers, radio transmitters/receivers etc.) and you intend to install a large number of electronic lamps at the one site."

Hamads Misunderstanding

A WIA member recently publicly accused the people involved in the production of Amateur Radio magazine of taking advantage of their prior knowledge of items advertised in HAMADS.

HAMADS are not the only way many items are advertised - even a casual remark on air can be followed up by an interested listener. Investigation of the accusation proved that the item in question was sold before the HAMAD appeared to a member of the same radio club as the vendor where the item had been advertised some time earlier.

It has long been WIA policy that no person assisting with the production of Amateur Radio magazine takes any action about the possible purchase of any HAMAD item until his/her personal copy of the magazine arrives in the mail.

The WIA is concerned about the number of inaccurate, unfounded derogatory statements being made on air from time to time. If you feel you have a cause for complaint, please approach your Division or the Executive Office and get your facts right before you broadcast it and perhaps make a fool of yourself. The WIA has enough trouble keeping its small team of volunteers without ill-considered on-air criticism of their ethics. ar

FT-747GX

BUDGET H.F. TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands, and general coverage reception from 100kHz to 30MHz. Convenience features include a front panel mounted speaker and unobstructed digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation, and 20 memory channels (eighteen of which can store split Tx/Rx frequencies). Wideband 6kHz AM and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes bonus hand microphone. See ARA Review — Vol II, Issue II.

Cat D-2930

2 YEAR WARRANTY

\$1099



FT-4700RH DUALBAND MOBILE TRANSCEIVER

Continuing the tradition started by Yaesu with the FT-2700RH, the new FT-4700RH dualband 2M/70cm FM transceiver now provides higher levels of performance, while offering even better value for money!

Features include 50 watts output on 2 metres (144-148MHz), and 40 watts output on 70cm (430-450MHz), with an inbuilt cooling fan for long term reliability. True full-duplex crossband operation is supplemented by dual band simultaneous reception or auto-muting reception (with independent squelch and mixing balance), so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The optional YSK-4700 controller cable allows the main body of the transceiver to be installed under a seat, while the front panel/controller mounts conveniently on the dashboard. On the control panel, the bright amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls have back-lit labels for clear readability, with a dimmer switch for nighttime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. And all this is backed up by our exclusive 2 year warranty, the longest in the industry. See ARA review Vol. 12 Issue 11 (Feb 1990), or A.R. review May '89.



\$999

D-3300

D-3301 YSK-4700 CABLE \$49.95



2ABQ AND 3ABP — FUN(?) WITH A SIMPLE BEAM

BILL RICE VK3ABP 54 MAIDSTONE ST ALTONA 3018
WITH ADDITIONAL DATA FROM
HARRY CAPSEY VK2OQ 58 ELLISTON ST CHESTER HILL 2162

Fred Caton VK2ABQ first published his design for a simple rotary wire-element tri-band beam in "Electronics Australia" of October 1973 (Ref 1). It consists of four horizontal radial spreaders arranged at 90° intervals around a rotatable mast. More than half of each spreader should be non-metallic, but the inner portion may be metal. Varnished wooden dowels inserted in electrical conduit or aluminium tubing were suggested. The length of each spreader (mast to tip) is to be 12 feet (3.66 m), but the metallic part should not exceed 5 feet (1.5 m).

Strung around these spreaders are three wire loops (Fig 1). The corners of the outermost loop (for the 20m band) are near the tips of the spreaders. The innermost (10m) loop is at half this radius (6 ft or 1.83 m), and the 15m element in between at a corner radius of 8 ft (2.4 m). If you calculate the circumference of each element, assuming it to be tightly stretched, you will find it is one wavelength at frequencies of 14.5, 21.7 and 29 MHz. In practice each wire should be longer, with considerable sag between radials, and then trimmed to resonance at the desired frequency in each band by use of a dip oscillator. Typical frequencies would be 14.2, 21.2 and 28.5 MHz. The resonant frequency of each loop, particularly the innermost, is influenced by the amount of metalwork in the spreaders. The height above ground at which it is checked will also have an effect on the resonant frequency. If they are set to the lower band edge at about chest height off the ground, the resonances will move up into each band when the antenna is raised to full operating height.

Coupling Insulators

So far described, the antenna is essentially three nested square loops, each of one wavelength circumference on its respective band, and all three fed more or less in parallel. Current at the feed point will have reversed its phase after travelling half a wavelength to the other side of the loop; but since it has travelled half-way round the circumference it is now going in the opposite direction, so is effectively in phase. Maximum radiation will therefore be broadside to the hori-

zontal element plane, is vertical. An antenna which radiates straight upwards is not much use for HF DX. What is needed is horizontal radiation, which requires the feedpoint side and its opposite side (spaced by quarter wavelength) to have a 90° phase difference.

This is achieved by cutting each loop precisely into halves at points a quarter-wavelength each side of the feedpoint, and inserting small insulators, which double as coupling capacitors. In effect, the loop now becomes two half-wave dipoles, one centre fed, spaced a quarter wavelength and with the outer one-eighth wavelength extremities of each bent backwards on one and forwards on the other until the tips almost touch. Between the tips are inserted the coupling capacitors, which enable the driven element to energise the other more effectively than if they were simply lying parallel at quarter-wave spacing as in a parasitic array. This second element acts as a reflector.

The actual construction of the side insulators/coupling capacitors is not critical and is determined mostly by mechanical requirements. The original 2ABQ article suggested coat buttons, the wire ends threaded through opposite holes, then knotted to prevent them pulling out. Later information (Ref 2) and also from 2OQ recommends small discs or squares of "Perspex" ("Lucite", methyl methacrylate) with the two holes not more than a quarter-inch (6 mm) apart. I would add to this that polystyrene should not be used (too sensitive to ultraviolet light) nor polythene (not strong enough). "Teflon" (PTFE) should be okay, but best is probably fibreglass, eg old printed circuit boards with the copper removed. Some PCBs may be phenolic; not so good, but it may do. Squares are as good as discs, and easier to cut out! The two wires should be threaded from opposite sides, and a single half-hitch knot in each is enough.

Why Not a Quad or a Yagi?

If you know anything about quads, you will realise that the 2ABQ antenna has the same dimensions as a single quad element. However, it lies in a horizontal rather than a vertical plane. But, whereas a single quad element is bi-directional, the 2ABQ has gain in the order of 4 dB

and a front-to-back ratio (fb) of 12 to 18 dB (front is the feedpoint side of the square).

Admittedly, 4 dB is not a lot of gain, but for a quad to exhibit forward gain and good fb, two elements are necessary, plus all the mounting hardware to attach them to the top of a mast midway between them. The array height (from top to bottom) is at least a quarter wavelength (17 ft or 5 m for 14 MHz). If diagonally mounted (sides at 45 degrees to the vertical) the height occupied by the array becomes 24 ft (7.3 m). The lowest point on the elements should be well clear of the ground. Even 20 ft (6 m) would be none too high, so the top of the array would be at least 37 ft (11 m) above ground. If other beam antennas (eg for VHF) are planned to go on the same mast they will need to be even higher.

Still on the theme of space requirements, the two-element quad will have a turning radius of about 11 ft (3.3 m) minimum, or 14 ft (4.4 m) for diagonal mounting. Altogether, the point of the argument is that the quad is not a good antenna for a small backyard, particularly if height is restricted by local regulations.

"Agreed," you say to this. "But what about a Yagi? One of the popular tri-banders or, even better, a full-size 20m three or four-element monoband?"

True, such antennas need little space vertically. Essentially they are all in one plane. So is the 2ABQ. But even a small tri-bander has a turning radius like a quad, and a full-size 20m beam will need more like 20 ft (almost 6 m), whereas the 2ABQ needs only 12 ft (3.7 m). Agreed that the big beam will work much better; its gain may well be eight or 10 dB, but it's a major engineering structure and, together with an appropriate tower, it will cost you thousands of dollars. And it works on only one band!

You Get What You Pay For!

"Right," you now say, "I'm persuaded! My backyard is small; the Council won't agree to a big tower; I can't afford a small fortune anyway! The 2ABQ sounds like a cheap and easy homebrew answer. Where's the catch?"

Yes, there are catches! Mostly they involve finding the best technique for

getting all that wire into the air, and then keeping it there, year after year, in spite of wind, rain, rust and ultraviolet! In 1983 I built a 2ABQ and began to learn how!

I mentioned earlier the possibility of other antennas above the HF beam. This is the case in my installation where, attached to a rotating mast there is a 2m Yagi at 50 ft (15 m), 6m and 70cm Yagis at 40 ft (12 m), and the HF beam at about 26 ft (8 m). The original HF beam (back in 1965!) was a homebrew triband Yagi which eventually fell apart, partly because of the unbalanced loading of dozens of pigeons which just knew it was there for their use!

Herein lies a problem. All the material published on the 2ABQ, plus that from Harry, presumes that the antenna will be assembled on the ground, tuned-up on top of a step-ladder, then raised to its final height on top of a mast used solely to support it. In my case it had to be assembled some 25 ft up in the air, around the existing mast rather than on top of it, and with no access to tune the elements! It could not be lowered further, because the first 25 ft (8 m) of the supporting structure is a tapering triangular tower of welded water pipe, with its feet firmly planted in the ground!

Choice of Materials

What follows is a step-by-step chronicle of how the antenna was assembled, from what materials, and what problems were encountered. Firstly, radial arms were required. At that time we had a small clump of bamboo in the backyard. Home-grown is even better than home-brew, so four good canes were selected, tapering from about 25 mm to about 10 mm. Harry recommends giving canes like these three coats of good paint. In 1983 I hadn't been told this, so the canes went unpainted. Even so, only one or two needed replacement over the next few years, but late in 1987 the whole antenna was demolished by our large, old (and rotten!) willow tree blowing down in a storm. It missed the VHF beams and didn't damage the tower, but it sure made a mess of the 2ABQ!

The new radials are all plastic. For three-quarters of the distance out from the mast, they use 1-1/2-inch (38mm) ID ABS pipe. ABS is acrylonitrile butadiene styrene, also called "Cyclocac". The remainder of each radial is 3/4-inch (20mm) PVC electrical conduit. The small tube fits into the larger for about 20 cm, the gap between them being sleeved with split sections of scrap plastic tubing, and the whole held together with a 5mm aluminium wire pin right through the full diameter and its ends bent over.

Centre Bracket

As mentioned earlier, most variations on the 2ABQ theme are intended to be at the top of a mast, so the simple method of mounting the radials is to weld a flat horizontal plate to the top of a water-pipe mast, and either attach the radials directly to it, or perhaps via an intermediate wooden platform (suggest 1 ft square by an inch thick, ie 30 x 30 x 2.5 cm). The radials may be fastened with small U-bolts and should pass over the corners of the platform to gain maximum support from it. If metal tubing is used for the inner portion of the radials the individual tubes should not be connected together or to the mast, but left to "float" electrically.

Another alternative is to use four pieces of light steel angle (1-1/2 in, 40 mm or thereabouts) welded or bolted to the top plate. Each should be 12 in (30 cm) long; or, better still, one piece might be twice this length and continue unbroken across the top, with the other two butted up to its centre at right angles. The angles might even be arranged with their 90° trough facing downwards, so that each acts like a little roof over the inner end of the cane radial to protect it from the weather. In all cases the radials will be held into their angle troughs with hose clips or wire lashing.

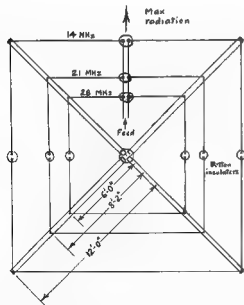


Fig 1 Original form of 2ABQ beam (as viewed from above)

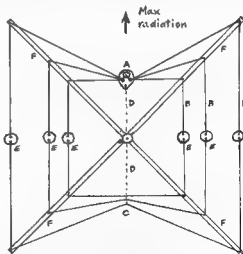


Fig 2 Improved version of 2ABQ beam

- Notes:
- A Feed point insulator and cable attachment point. Seal with silicone
 - B Element lengths (complete loop)

14 MHz	69 ft 0 in	21.03 m
21 MHz	47 ft 0 in	14.33 m
28 MHz	35 ft 0 in	10.67 m
 - C No connection between elements at this point
 - D Nylon cord to pull in elements
 - E Button insulators see text
 - F Insulating radials 12ft (3.66m), long

My first version used two steel angles one above the other at 90° to each other and the 2in water-pipe mast, and each clamped to the mast by a 2-1/2in U-bolt. The bamboo canes were lashed to the angles with twine. Obviously I didn't expect it to last, did I? Nevertheless, it was still usable until the willow fell all over it!

In the rebuild, I used a scrap piece of right-angle anodised aluminium building extrusion about 6 x 6 x 12 in (15 x 15 x 30 cm) bolted to the mast with two U-bolts. Two pieces of one-inch-square steel tube, each about a metre long, are clamped one to each face of the extrusion, and touching where their centres cross over. The tubes are each clamped with four bolts and two saddles, rather than weakening them by drilling bolt holes through them. The ABS plastic radials fit neatly over the square tubes, and are pushed on to them until they butt up against the centre bracket.

Element Wire and Clips

Once the radials are in place the element wires can be attached. This is obviously much easier near ground level than eight metres or more up in the air! The wire must be stranded for flexibility, as the durability of the whole antenna depends on it being able to "flap and flop around" in the wind. It is very important that the elements should not be tied down tightly to the radials where they pass over them, but should be free to slide sideways. In the original article (Ref 1) it was suggested that small cup-hooks should be screwed into the tops of the radials, at the correct radius for each element, to prevent the wire moving inwards while still permitting sideways motion.

Following this advice, I used cup-hooks on my first version, screwed into bamboo, but found quite soon that they either worked loose or rusted away much too quickly. Various schemes using aluminium wire were attempted, but the problem really had not been solved before "Willow Day" made it all past history. On the new plastic radials I have also used bent wire hooks, some wrapped around the tube, some through drilled holes, some restrained by cord out to the next one. Some are better than others, but as Browning said, "The best is yet to be!" Suspension by cord loops may be the answer.

A confession at this stage. I have yet to fit a 10-metre element! The 15 and 20-metre elements are working, but somehow I didn't finish one for 10 metres. When I do, I will take down the radials one by one and try to optimise the clips.

Availability of suitable stranded wire may be a problem. In the "good old days" seven-strand bare electrical earth wire was easily obtained. It is still much the

same size now (although metric) but is only available with yellow/green stripe PVC insulation, which reduces flexibility and increases weight and wind load. It is really too heavy, anyway, although some may have used it. Heavy grade plastic hookup wire is better. I really economised by stripping wire from burnt-out transformers or motors and twisting up seven strands to various lengths with a hand-drill, then spliced them together to make up the necessary length!

Putting the wire into place, way up in the air, is a problem which really taxes one's ingenuity. As mentioned earlier, it is virtually impossible to check *in situ* with a dip oscillator, so the elements must be pre-cut to the specified lengths and the insulators fitted before lifting them into position (see Fig 2 for preferred arrangement). First, one end is connected to the feed point. Working near the top of the tower, alongside the centre bracket, the free end is then pulled up over the radials and connected to the other feed point terminal. The wire is then pushed outwards with a length of bamboo (V-slotted at the outer end) until it can be hooked over its retaining clip on each radial in turn.

This is a frustrating procedure, particularly when the backyard near the tower is covered with fruit trees, garden beds, a wood-shed and the shack! The dangling wire inevitably catches on one or more of these obstacles and refuses to come unstuck! One gets one's exercise quota going up and down the tower like the proverbial "fiddler's elbow"! An assistant at ground level makes the job easier. While working at the job, a safety belt is essential, both to reduce the risk of falling and also to leave both hands free. Believe me, even two hands are insufficient for some of the anags one can encounter!

Feed Point and Feed Line

Fig 1 shows the antenna layout as originally published in Ref 1, with the feed point for each element being some distance from the other two, but all connected together by (as one possibility) 70 Ohm parallel wire feeder.

A later development (Ref 2) is to pull in the outer two elements to coincide with the inner at a common feed point for all three. The other side of these elements, diametrically opposite the feed point, is also pulled in (with nylon cord, for example) to form a near-symmetrical "bow-tie" shape. A warning here is that there should be NO CONNECTION between the elements at this point.

The feed point impedance is claimed to be around 60 Ohms on all three bands, so it is convenient to feed with either 50 or 70 Ohm coax cable, and is claimed not to require a balun. The impedance is proba-

bly a rather critical function of element length and the precision with which it is bisected by the insulators. I could not "dip" the elements and had to cut them in advance, while one or two subsequent breakages have caused them to become a little shorter and somewhat asymmetrical. The absence of the 10m element may also have some effect. Perhaps, therefore, it is not surprising that my SWR readings are not as good as Harry's! He claims 1.3 on 20m, 1.2 on 15m and 1.0 on 10m. On my (home-brew and pre-Dawla!) cross-point reflectometer I get more like three to one on both 20 and 15m, and find it desirable to use a transmatch at the input to the 50 Ohm coax.

In Conclusion

This article came about for several reasons. Primarily, it goes back to the rebuilding of my 2ABQ after "Willow Day". I ran into all sorts of problems; many have been mentioned in this article. So, in my June 1988 editorial, I asked how many others had useful ideas about how to build a 2ABQ beam. I was surprised to get only one response, from Harry VK2OQ, but he provided much information, both direct from Fred VK2ABQ (himself a good friend of Harry) and from Harry's own experience. Ever since, it has been a problem to find time to "write it all up", but the decision to publish a special Antenna issue spurred me into action!

The second reason is that it is an antenna which I think needs to be better known. Largely because of G3VA and the RSGB, it is popular in the UK, especially for small backyards, but seems to be not as well known here (the prophet in his own country, perhaps?).

The third reason is that it is capable of performance not far inferior to many commercial beams, yet can be built cheaply by any average handyman (or even handylady!). With just 10 and 15m elements it could be a good Novice antenna. Since its original publication we now have the 18 and 24MHz bands. Could elements for these frequencies be inserted between the others? Sounds like a "five wire beam in space"! Would someone with more time than I have like to give it a go?

Incidentally, Harry says in his letter to me that he is aged 80 plus, while Fred is 70 plus. Since I am 60 plus, it seems time for someone younger to take on the development task. At least, you can't now claim that you don't know anything about it. Over!

References

1. Fred Caton VK2ABQ "Electronics Australia" October 1973 p69
2. Pat Hawker G3VA "Amateur Radio Techniques" (7th ed 1980) p334 ar

160m HELICAL VERTICAL

N CHIVERS VK2YO
51 MEERES CRES
FAULCONBRIDGE 2776

The VK2YO 160m helical vertical antenna system as illustrated should be capable of being duplicated by anyone with the will and patience to do so.

There are plenty of well proven antennas for 160 m in use, but they all have some disadvantage which precludes their use at my QTH.

1. I live in the Blue Mountains of NSW, on a quarter-acre block of land that is a rock shelf with a thin covering of poorly conducting soil.

2. I have been using an end-fed wire or a G5RV working against the ground whose resistance varies with the weather.

3. Other amateur operators have told me they would like to work 160 m but do not have enough room to put up a decent antenna and/or earth system.

The most popular 160m antennas seem to be some form of loaded vertical radiator worked against the ground, the ground being the missing half of the antenna. I have used helical whips on the higher HF bands for many years while mobile, and found them to be excellent short antennas, so helical short radiators would be the way to go, I thought. To try this out, I roughly coupled together two shortened surplus 11m whips.

The antenna is constructed on 2 x 2m fibreglass rods (wood curtain rod would do). Each rod has a PL259 coax plug at the end. These screw into a coax tee piece, (4) on the diagram, so that the bottom rod hangs vertically, and is mechanically rigid under the top rod. The top rod is fitted with a hook to hang it from a convenient support, or rope stretched between two points.

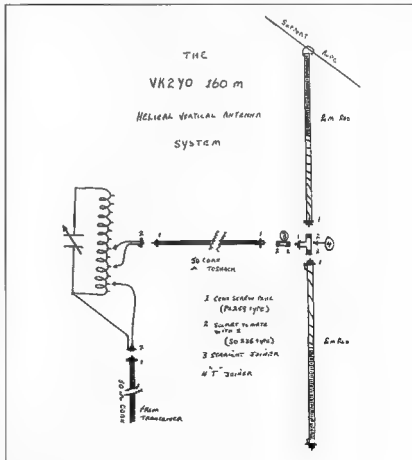
Wind enough wire onto one of the rods at the opposite end of the PL259 plug so that when coupled to a dip oscillator it will show self resonance at about 3.6 MHz. This took 132 m of 26 SWG enamelled wire scrounged from an old power transformer primary. The wire is close-wound over 1.2 m of the rod then the winding is tapered to connect with the PL259 plug coaxial connector at the other end.

Repeat this process for the other rod. The upper rod's wire connects to the centre of the PL259 plug, while the lower rod's wire connects to the outer collar of its PL259 plug. When assembled as a dipole, the inner coax wire feeds the upper helix while the braid feeds the lower.

With the two rods assembled with the inter-connecting coax "tee", they were supported horizontally across the backs of three chairs. A socket with a one-turn loop was screwed onto the plug section of the tee coax connector (4). A GDO was coupled via this loop and dipped at 1.79 MHz, but when raised to its operating position vertically suspended from a crossarm half a metre out from the support pole and the bottom rod one metre above ground, the resonant frequency went up to 1.86 MHz. Squashing the turns up a bit produced self resonance at 1.83 MHz, which is near to the most used part of the 160m band. The turns were then fixed with a coating of araldite to try to keep the resonant frequency stable.

I coupled direct to the station transceiver, TS6808, with 50 Ohm coax. Receiving results were encouraging but on transmit they were poor due to a bad mismatch. With a tuner in line I could not get the VSWR down low enough for the transceiver protection circuits to allow full output. After constructing an impedance bridge I investigated the problem.

The bridge nulled broadly about 20 Ohms at 1.86 MHz. Obviously, impedance transformation needs to take place between the transceiver and its load. My available tuner would not do the job so I built one that would work. Remembering that receiver RF amplifiers using transistors are often tapped along the tuned circuit for best match and the aerial is



The VK2YO 160m Helical Vertical Antenna System.

HOW TO WIND THAT NON-RESONANT HELICAL

RICHARD BURDEN VK6FKB PO Box 1164 BOORAGOON 6154

Recently I installed a modified CB into the car for operating 10m mobile. After several days of having to remove and replace a large whip every time I entered or left the carport I started to look for a better way. There were two options: mount the aerial somewhere else besides the centre of the roof or use a smaller whip.

A quick look at the price of buying the bits and pieces to mount the aerial elsewhere convinced me I should consider a shorter whip.

Whatever form of loading was used to resonate the whip it was unlikely to present a 50 Ohm impedance to the feedline at resonance.

I didn't want to expose the reverse side of the aerial base to use a Dip Meter to check for resonance or to install a matching network at the base to match the feedline to the aerial. That was becoming altogether too hard. And a mechanism to adjust the length was ruled out because I wanted to use the biggest aerial possible.

But I did see a way out of the predicament. A length of coax between the aerial and the transceiver was going to transform whatever impedance the aerial had at the operating frequency to some different value of both resistance and reactance at the transceiver end of the feedline.

If the aerial presents the right value of reactance to the feedline, this would be transformed to a nil value at the other end. The resulting resistance could then

be matched to 50 Ohms with a simple L network. The aerial will still radiate, but the efficiency will be reduced.

This was a convenient approach because my homebrew noisebridge was calibrated on the resistive scale but not for the reactance scale. The approach I adopted was 'forget about resonance at the aerial and concentrate on getting a resistive impedance at the transceiver end of the feedline'.

The tape measure said I had only 85cm of clearance when the car was in the carport. The hacksaw quickly reduced an old whip to 80 cm. I stripped the outer covering and removed the remaining winding.

I was surprised at just how small a gauge of wire was used. The wire I used in the rewinding was approximately one millimetre in diameter, at least twice the diameter of the original wire. Initially I wound a half wavelength on the aerial, evenly spacing the turns. With a short whip this meant the turns were closely spaced.

Parking the car in an open space I set the radio to the centre of the frequencies it covered and attached the cables to the noisebridge. With the aerial in position I found a null on the noisebridge.

Removing a 20cm length and spreading the remaining turns evenly over the aerial's length I returned the aerial to its mount. The null had moved in the right direction! I repeated this process several times before the null indicated zero reactance was present at the transceiver end

of the feedline.

I slipped the heatshrink tubing over the aerial. At this stage I did not shrink the tubing. Checking the null I found I had to take more wire off. Two more wire removing exercises eventuated before I had returned to a null indicating a non-reactive termination of 15 Ohms.

Back in the garage I shrank the tubing. It was a straightforward exercise to calculate the required values for the L network and put it all together.

Back to the open space, and the SWR was measured as 1.5 to 1. How well did it work? A low-level signal was set up in the garage and the car placed at the far end of the driveway. The 80cm whip with matching network was measured as having a loss of just one decibel in comparison with a Yaesu 10m mobile aerial.

In mobile operation the results have been mixed. Local contacts have given signal reports which vary from good to very bad. Long distance contacts have usually been good. If you can hear a station over the electrical noise from a mobile environment, chances are it will hear you. Based on prior experience I would rate the overall results good for a mobile aerial.

I am not going to consider reverting to a larger whip mounted somewhere else. The ground loss increases if the aerial is mounted lower on the car, possibly negating any extra efficiency the larger aerial might produce. **ar**

Continued from page 14

sometimes also tapped to this coil in a different position for the same reason, if link coupling is not used, I reasoned that this system should work on transmit.

On a piece of orange 20mm diameter electrical conduit I wound 100 turns of 18 SWG, tapped every five turns. Across this coil is connected a wide-spaced 20pF to 150pF variable capacitor of World War Two vintage.

This combination tunes from about 1.75 MHz to 1.95 MHz, and, by trial and error moving the taps up and down the coil and adjusting the capacitor, a low VSWR is obtained.

Coax feed could be replaced with open wire if desired, if convenience of entry to the shack and insulation is not a consideration. I have not tried open wire feed as

it is not convenient. The interconnecting coax between the antenna and tuner should be kept as short as possible to minimise radiation from the braid of the coax as indicated on transmit by an absorption wave meter.

A word of warning at this point. Do not connect the transceiver to the tuner or the tuner to the load (antenna) via a coax switch, as the braid side is common to all connected antennas and is often connected to earth for lightning protection, and this helical vertical dipole floats above ground and is independent of it.

If the station transceiver is separately RF grounded, then the tuned circuit should be fed by a link coupling wound over the centre of the tapped coil with a series capacitor in one leg of the link. I have tried this, and it works equally as

well as direct coupling. I used a ceramic-based mica capacitor of 10pF to 100pF range in series with the link of about 20 turns 18SWG.

Compared to the end-fed wire about 80m long that I usually use at my QTH, it is in most respects equal or better, usually by one S point on transmit. I have worked stations such as VK2MQ in Tumut, VK2AMI in Glenbrook and VK4YB in Caboolture in a group with others on the same evening with reports better than the end-fed wire. On receive it seems to pick up more atmospheric noise than the horizontal end-fed wire.

If it means the difference between having a 160m QSO on net, then this antenna may be the answer for the cramped space amateur or the amateur with a poor earth. **ar**

PHASED BOBTAIL CURTAINS

ODUS W LOVELL W5VXG Rt 1 Box 398
POLLOCK LA 71467 USA
SUBMITTED BY J VOGEL VK6BA

The bobtail curtain has been around since the early 1930s. It is an oldtimer's antenna. Two of them can be phased for increased gain with little trouble. This article shows how to phase two bobtail curtains with a simple matching and phasing harness.

Phased bobtail curtains have a number of advantages. They have good bidirectional gain and no ground screen or radials are required.

Phasing two together is simple for a spacing between them of 0.2 wavelength. A closer spacing of one-eighth wavelength would yield more gain but the phasing harness and matching would be more complex. This would be due to the lowered feed impedances at a closer spacing.

A single bobtail curtain is shown in Fig 1 with dimensions for 15 and 20 metres given in Table 1. The bottom ends of the vertical have six-inch wire springs which are trimmed with sidecutters to tune for lowest VSWR.

A phased array of two bobtail curtains is shown in Fig 2. The phasing harness is shown in Fig 3.

The feed impedance of each bobtail curtain is approximately 25 Ohms. See Fig 3. This 25 Ohms is repeated a half-wave down the top line. It is then transformed to 100 Ohms by the next quarter-wave of line. The second bobtail curtain's feed of 25 Ohms is transformed to 100 Ohms by the bottom quarter-wave of line. The two 100 Ohm impedances in parallel at the "tee" give 50 Ohms, thence RG58 or RG8 of any length may be used to connect to the rig.

The top phasing line is physically longer than the bottom phasing line. Coil up the extra length in a six-inch-diameter coil near the tee connector. See Fig 2.

I believe it is good practice to keep the phasing lines and feed-line horizontal for at least a half-wave from the closest bobtail curtain. See Fig 2.

Height of the bobtail curtain flat-top portion ideally should be approximately 0.45 wavelengths. Thirty feet on 20 metres or 20 feet on 15 metres. This is to ensure good low-angle radiation.

My 20-metre version has two major lobes fore and aft, with minor lobes either side. See Fig 4.

Hope you try the phased bobtail curtain and that it works for you.

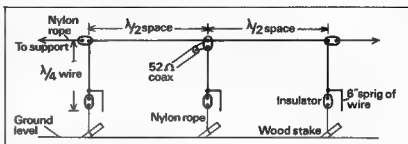


Figure 1 Single Bobtail Curtain

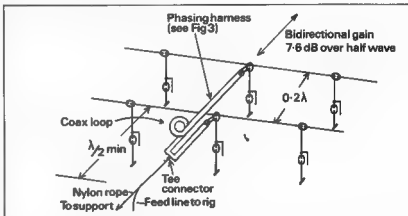


Figure 2 Phased Bobtail Curtain

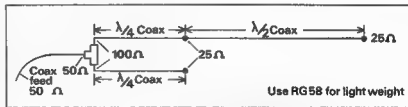


Figure 3 Phasing Harness

	20 metres f = 14.2 MHz	15 metres f = 21.25 MHz
1/2 space = 492/f		
lambda space =	34 ft 7-3/4 in	23 ft 2 in
1/4 space	69 ft 3-1/2 in	46 ft 4 in
0.2 lambda space	17 ft 3-15/16 in	11 ft 7 in
1/2 wire = 468/f		
lambda wire	32 ft 11-1/2 in	22 ft 1/4 in
1/4 wire	65 ft 11 in	44 ft 1/2 in
1/4 coax = 1/4 space x 0.66	16 ft 5-3/4 in	11 ft 1/8 in
1/2 coax = 1/2 space x 0.66	11 ft 5-3/16 in	7 ft 7-5/8 in
3-1/4 coax = 3-1/4 space x 0.66	22 ft 10-3/8 in	15 ft 3-3/8 in
	34 ft 3-9/16 in	22 ft 11 in

(Note: Dimensions given are feet and inches as the source country is not metric. Readers may convert if desired using 1ft = 0.3048m and 1in = 25.4mm. (N2Z, M0J))



Figure 4

Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

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What about amateur radio projects? Well, as you can see there are more of these than before – but we're very interested in publishing more. So if YOU have developed an exciting amateur radio project, contact Jim Rowe by writing to him at EA, 180 Bourke Road, Alexandria 2015. Or phone him on (02) 693 6620, to discuss the possibility of publishing it as a contributed article. As well as earning a fee, you'll also be helping to boost interest in amateur radio!

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ICOM'S MIGHTY MIDGETS

The new Icom R1 and R100 wideband communications receivers are very tiny – but how do they perform? Jim Rowe has been trying them out

TEN YEARS OF SBS

It's 10 years since Australia's unique low-budget multicultural TV broadcaster began operating. Here's a look behind the scenes showing how it puts those programs to air

MORE VIEWERS FOR ATV

PETER JONES
LIAISON OFFICER SEQ-ATV GROUP

The South-East Queensland ATV Group has increased the range of its television repeater with higher transmit power and a new antenna.

After months of planning and construction, a horizontally polarised double-stacked Alford Slot antenna was built and tested, before being put into position atop a 20m mast on an inner Brisbane building.

The Alford Slot was chosen to replace the vertically polarised collinear for several reasons:

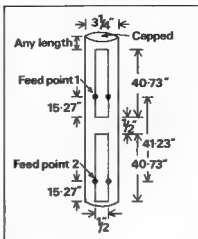
1. It's more easily picked up by existing domestic TV antennae.
2. It's omni-directional.
3. It has a gain of approximately 9dB over a dipole.
4. Its solid construction stops it flexing in strong winds, which has been causing varying signal strengths in fringe areas.

The repeater has an input frequency of 444.25 MHz and an output of 579.25 MHz — approximately channel 35 in the UHF band.

ERP is now 200 Watts.

Signal strengths have increased in all suburbs, resulting in a number of new members joining the group.

The SEQUATV's address is PO Box 3, Chermside, 4032. ar



Dual Alford Slot for 580 MHz

$$\lambda = \frac{300}{580} = 517.24\text{mm (20.36")}$$

$$2\lambda = 1034.48\text{mm (40.73")}$$

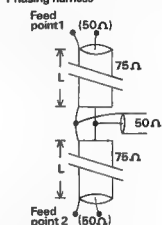
$$\text{Feed Point} = 0.375 \times 1034.48$$

$$(50 \text{ Ohm}) = 387.95\text{mm (15.27")}$$

$$\text{Circumference} = \frac{\lambda}{2} = 258.62\text{mm (10.18")}$$

$$\text{Diam} = \frac{258.62}{\pi} = 82.32\text{mm (3.24")}$$

Phasing harness



Matching Harness

$$\frac{\lambda}{4} = \frac{517.24}{4} = 129.31\text{mm (5.1")}$$

$$\text{Velocity Factor} = 0.79$$

$$\text{Corrected } \frac{\lambda}{4} = 102.15\text{mm (4.02")}$$

total length, for mechanical reasons, would be:-

$$L = \text{either 5 or 7 times } \frac{\lambda}{4} \text{ (i.e. odd multiples of)}$$

for 5 (multiples)

$$L = 510.8\text{mm (20.11")}$$

or for 7 (multiples)

$$L = 710.1\text{mm (28.15")}$$

CHINESE AMATEUR IN SYDNEY

Zhou Yu Hong, the Vice Secretary General, Shanghai Radio Sport Association, has arrived in Sydney for a six-month-long course of intensive English instruction. Greeting him at a welcome dinner in Sydney were, from left: Zhou; Thomas E King VK2ATJ; Sasha Baer, Publicity Officer, International Amateur Radio Network; and Sam Voron VK2BVS, IARN, Director for Overseas Development Projects and Disaster Assistance.



YOU TOO CAN HAVE A 1 TO 1 SWR

BILL ROPER VK3ARZ
3 TAMAR COURT
MENTONE 3194

One of the most talked about subjects on the lower amateur HF bands is SWR — standing wave ratio. Listening on the 80-metre band, it seems many amateurs spend a considerable amount of time trying to reduce the SWR at the transceiver end of their antenna and find a perfect one-to-one match.

Most modern transceivers require the antenna system load to be near to a perfect match, that is less than a two-to-one mismatch, although most generally work quite efficiently up to that level of SWR. That is a good reason to want to reduce the SWR.

One solution to the problem can be found with open wire feeders to the antenna, and an antenna tuning unit (ATU) at the transceiver.

However, as in my case, not everyone is prepared to accept the relative unsightliness of open wire feeders, particularly if the antenna feedpoint has to be over 100 feet from the shack. Also, having to retune an ATU every time you change bands or change frequency by a large amount is a nuisance.

Therefore, a common antenna in use, particularly in restricted real estate locations, is an inverted V dipole, hanging off the mast or tower supporting beams for the higher HF and/or VHF/UHF bands, fed with coaxial cable. It is relatively easy to adjust the SWR at resonance of such an antenna to below the two-to-one demanded by most modern transceivers. But difficulties then occur when you want to change frequency to either end of the band. The SWR soars up over two to one and the transceiver power output starts dropping off rapidly as the automatic SWR protection circuitry comes into operation.

Obviously the SWR of the antenna needs to be such, at the resonant frequency, that the SWR at either end of the band remains below two to one.

How to achieve that?

Like most amateurs you probably cut the 80-metre dipole to about 132 feet long, split it exactly in the middle for the feedpoint, and adjusted both ends by equal amounts until the lowest SWR measured at the transceiver was at your favourite

frequency, or at the middle of the band. Then, no matter what you did, the SWR refused to come down below two to one or, if you were lucky, below 1.7 to one.

Let us look at the perfect dipole for a moment. About 132 feet long for the Australian 80-metre band, it would have a centre impedance of 70 Ohms if it was the correct height above ground and was completely clear of all nearby objects such as trees, power and telephone lines, metal towers and gutters etc.

Is your antenna installed like that? If so, you are indeed lucky.

Most 80-metre antennas, especially if you live in the suburbs, are installed as an inverted V, with the dipole legs running close to all sorts of other objects, and are fed with 50 Ohms impedance coax.

In this type of installation it is most unlikely that you will achieve the desired SWR, because the antenna is both mismatched and unbalanced. The chances are that, with the presence of all the foreign objects, different ones to each leg of the dipole, one side of the antenna will have greater capacity to ground than the other.

The solution is easy. Assuming that each leg of the dipole was cut to the same length to start with, and both legs have been trimmed by an equal amount to adjust the resonance of the antenna to the desired frequency, lengthen one leg and shorten the other leg by the same amount. The resonant frequency of the antenna will be virtually unaffected, but the SWR will have changed. If the SWR went higher, then the alteration to the antenna was in the wrong direction. Reverse the alterations to leg length and try again. With a few adjustments you will soon achieve an SWR close to the idealistic one to one.

I have been using this method of adjustment of HF wire dipole antennas for many years, and am surprised how few amateurs seem to know about it. The 80, 40 and 30-metre inverted V dipoles at my location (a small suburban allotment) are all fed from the same feedpoint on the side of the tower supporting the HF and VHF beams via a balun and a common RG8 coaxial cable 120 feet long. These antennas were all tuned to show, at the

transceiver, an SWR of one to one at the relative band centre frequency, and facilitate rapid band and frequency changing without having to worry about adjusting an ATU or the SWR at the transceiver. ar

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5/8 WAVELENGTH VERTICAL ANTENNA FOR 435 MHz

NORMAN E GRIFFITHS VK4ZFK
8 ALLAMANDA CRES TOWNSVILLE 4814

This antenna is based on a two-metre 5/8 wavelength mobile whip in use at this station. The dimensions have been scaled down to suit frequencies between 432-438 MHz, and an optional ground plane provided for fixed station use. It is simple to construct from readily available materials and easy to adjust for low SWR and has a gain of about 3 dBD. It comprises a 5/8 wavelength radiator fed by a length of coax which is also the matching section to 50 Ohm feedline.

Materials: 308mm length, 3mm diameter brass or brazing rod; 110mm length 6mm diameter brass or copper tube; 64mm length 16-19mm diameter nylon insulator (see text for alternative); 125mm length of RG-58/U with outer sheath removed; one PL-259 plug with points filed off.

Construction: Insert the 300mm length of brass rod into the 6mm diameter tube to a depth of 13 mm and solder. It may be necessary to use copper or brass shim packing to make a sound fit. The total length should be 405 mm after joining. Next take the nylon insulator and fill with epoxy or glass fibre resin. If

not obtainable, use a 24mm length of 16mm diameter glass fibre electrical conduit. This insulator should be drilled as shown in figure 1. Now slip the insulator into the modified PL-259 connector, bond the PL-259 sleeve centre portion and the insulator into a single unit with epoxy. This portion must be waterproof.

Take the prepared matching coaxial section. The soldering between inner and outer as shown in Fig 1 should be done carefully to ensure it slides easily into the radiator tube. Now tin the centre conductor and slide the coax into the tubing until the end of the braid is level with the tube end. The braid should be carefully soldered to the end of the tubing.

Measure the distance from the tip of the PL-259 to the tip of the insulator. Measure the same distance along the tubing from the tip of the coax centre conductor and mark the tubing. The radiator section should be inserted into the insulator to the mark and the coax conductor soldered temporarily in order to check VSWR before final assembly. A figure of 1.2:1 or less should be obtained.

When all is in order, the radiator and insulator should be fixed with epoxy.

If the VSWR is not very low, check at two frequencies about 6MHz apart and observe which VSWR is lower. For low VSWR with low frequency, shorten the coax or shorten the radiator. If the higher frequency shows the lower VSWR, the reverse applies.

For the best performance the antenna should be mounted on a good ground plane, either car boot or roof.

Optional Ground Plane: 4-2mm diameter, 200mm long brass rods or 16SWG copper wire; 1-50mm x 50mm piece of single-sided PCB. 1-SO-239 bulkhead socket. (See fig 2.)

Construction: Drill the PCB to take the SO-239 socket. Solder the four brass rods to the PCB at 90° to each other. Mount the socket and connect the coaxial conductor to centre pin and braid to a solder tag mounted under one of the socket mounting nuts. The cable and connections should be protected with a non-hardening silicone compound to prevent ingress of water. The radiator was silver plated as a final touch — but not strictly essential.

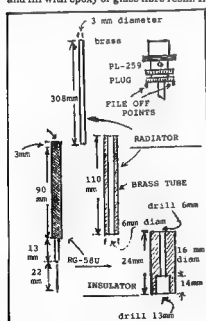
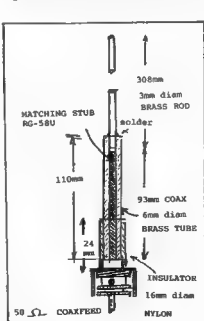


Fig 1 Details of parts for 518 Antenna



Section of Assembled 432 MHz Antenna

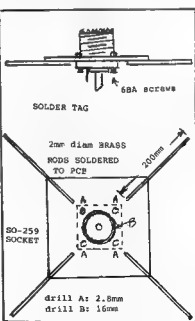


Fig 2 Details of Ground Plane

ANTENNA AIMER

HOW TO REBUILD AN ANTENNA ROTATOR CONTROLLER

STEVE MAHONY VK5AIM
19 KENTISH ROAD ELIZABETH DOWNS 5113

Some AR readers may have on hand or may in the future acquire an antenna rotator, the part that actually rotates the beam antenna, without the control box.

Typical may be a deceased estate, where the tower, rotator and beam antenna may be left still standing, as it is difficult for the relatives to dismantle and sell, while the gear in the shack, eg transceiver, power supply, antenna tuner, SWR bridge and rotator controller, is readily carted down to the local second-hand dealers and sold. After reading this article, you may decide to keep your ears and eyes open for just such an opportunity. It does happen.

Most rotators run at 30 Volts AC, for safety. The motor is usually about 1/10 Hp, 30 V AC, split windings, with a high value unpolarised capacitor, to enable its direction to be changed, ie CW and CCW. This is done by feeding either winding via the capacitor to make it rotate in the desired direction. (Fig 1)

Some form of remote indicator is required to indicate in which direction the antenna is pointing. This can be done

with a voltmeter rescaled in south, west, north, east, south, which is quite easy to duplicate. About 15 Volts AC is rectified, filtered and regulated down to 12 Volts DC. (Fig 4). In the rotator, there is a potentiometer driven by the final drive system to travel through 360°, either directly or through a gearing system 36 to 27. The wiper of this pot, along with either end, is brought back to the controller. This pot is used to drive a voltage divider so that south it reads 0 Ohms, north 1/2 Ohms, and south again reads Max Ohms. If the 12V DC is connected across the ends of this potentiometer and the wiper connected to the voltmeter, then at the intermediate positions of the rotator, the voltmeter will read a proportional voltage, eg South = 0 V, north = 6 V and south again = 12 V. (Fig 2)

Before you decide to make your controller, you must check that the rotator is working and identify the connections. If it is a well-known brand such as a DARWA 7500 series, you are halfway there. Beg or borrow a copy of the circuit. You will see a similarity between the maker's circuit and the circuits of this article.

If you cannot obtain a circuit, you will have to check out the terminals with an ohm-meter. The motor windings will be very low resistance, eight to about 18 Ohms each winding, eg a total of three terminals. Record this...

The position potentiometer will be from 500 Ohms to 1k Ohm total resistance, with an intermediate value for the wiper, eg 250 to 500 Ohms, depending from which end you measure. Again three Terminals. Note this for future reference...

It depends on the make of the rotator whether the phase shift capacitor is in the controller box or up in the rotator. If you are lucky enough to obtain a circuit, it will be shown on this. It is just a large value non-polarised capacitor, 90µF to 100µF at about 50 volts AC. If yours is in the rotator, it will be easy. If not, you will have to find out or guess its value. At this point it may be wise to seek assistance from someone who has some electrical knowledge, or give up and look for another rotator.

To check that the rotator is working, all that is necessary is to apply 15 to 30 Volts AC to the motor windings. It will run on as low as 15V AC. Three of 6.3V AC heater windings seriesed and phased will do the job. After identifying the motor common, connect one side of the AC to this terminal, and momentarily apply the 18 V to one of the motor terminals. You should have checked them for continuity and resistance to identify them. The motor should run, and the unit rotate in one direction. Transferring the AC to the other terminal should make it turn in the other direction. Some rotators (your circuit, if you have been able to obtain one, would show this) have two limit switches built-in. They are to prevent the unit from going more than 360°. After all, who wants to tie his coax cables in a knot? Simple, low power units only have a mechanical stop and stall the motor. Continued application of the AC will burn out the windings, so be careful. If your rotator won't go with the AC on one winding, try the other terminal. If it goes okay, return the AC to the previous terminal after the rotator has travelled

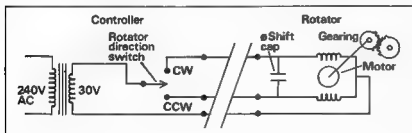


Figure 1

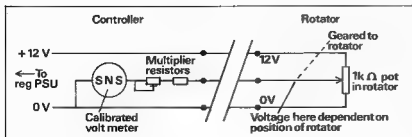


Figure 2

about 45°. If it goes the other way now, you probably had it at the stop, or had reached the limit and operated one of the limit switches. You should be able to trip these limit switches in both clockwise and counter-clockwise rotation. You should be able to run it the full 360° and back again.

While you have this set-up, it is a good time to check out the position potentiometer. If you have previously identified the pot terminals, you can connect your ohm-meter, multimeter on a suitable scale, across the end and wiper of this pot. You should have established its value on your previous checks. With the ohm-meter connected and it reading some value, lower than the total value, apply the 18 Volts AC briefly to the motor windings again. The resistance should either increase or decrease, depending on the direction of rotation, and the wiring of the pot. If you can get total resistance and minimum resistance as you go from clockwise to counter-clockwise, things are looking good. Change over the ohm-meter lead from one end of the pot to the other end and repeat the procedure. Minimum and maximum resistance should be obtained with no sudden jumps or open circuits. If all these tests work, then it is worth making up a control box for the rotator. Sometimes the motor common is internally connected to one end of the position potentiometer to save on conductors in the connecting cable.

Now, some ideas to assist you in making up a controller . . .

Most motors require only about one Amp only intermittently. After all, who runs a rotator for more than a minute, even if it is to get the antenna from south all the way around through north and nearly back to south again? One of the readily available A&R transformers has 30 Volts at one Amp, with taps down to 15 Volts, and is suitable. The 30V AC is used to run the motor via a three-position switch. A spring-loaded centre-off toggle switch is used for this. One with a larger

lever toggle is best. It is mounted so the toggle lever goes sideways. It must be spring-loaded with 'off' in the middle, otherwise you could run the motor continuously and possibly burn it out.

To run the position indicator, a single diode rectifies the 12 to 15 Volts from the transformer tap, and is filtered with a 1000 μ F 25/30V electrolytic capacitor. This is further regulated with a three-terminal regulator IC, a UA7812 or LM317, or even a LM3805 5V regulator, jacked up to around 12 to 15 Volts. The voltage is not critical as long as it is regulated. Don't forget the 0.1 μ F bypasses on the regulator IC. A heat sink is usually not necessary. A standard 12 to 15 Volts at 500 mA power supply would also be satisfactory. (Fig 4)

The indicating meter can be whatever you can obtain. 0-1mA is a good choice, 500 μ A, or even 100 μ A will do. It needs to be reasonably large to enable the position of the antenna to be read from a distance no smaller than 50 mm; larger is better. Choose a suitable series multiplier resistor and trim pot to make your meter read FSD for the supply voltage: eg 0-1mA = 1000 ohm/Volts, so a 10k Ohm resistor and a 5k Ohm trimpot would do. The power supply/regulator can be made up on some resistor strip or even a small PCB or Veroboard. The multipliers and trimpot can be mounted on the back of the meter on the terminals, along with a couple of back-to-back diodes to protect the meter movement. You may like to put a 1 μ F low-voltage electrolytic cap across the meter to dampen it down a little. (Fig 4 lower)

Some form of indicator across the motor circuit is necessary to tell you the motor has voltage on it. A diode, a series resistor and a LED connected from the motor common to either side of the switched motor circuit will do this. A 1N4004, 1.5 kOhm resistor and a LED is suggested. It works in both directions, as the AC passes through the shift capacitor. (Fig 3)

An on/off toggle or rocker switch and a

neon indicator are used to control the 240V mains. Don't forget a fuse for the mains and an anchor for the mains cable. With all my rotator controllers, I have fitted a multi-pin socket on the control box and a corresponding plug to the end of the rotator cable. Something with respectable pins to avoid voltage drop. An eight-pin Octal valve base and plug is good. An eight-pin Jones plug/socket may be used, as long as the pins are sufficiently large.

Another help in identifying the controller to rotator wires, is to use the standard resistor colour code, eg 1 = brown, 2 = red, 3 = orange etc. The plug/socket along with the colour code makes it so easy to disconnect for checking, and minimises any error in connecting it up again. After all, you don't want to put 30V AC across the 500 Ohm pot up in the rotator and burn it out! The choice of box for the controller is left to you. Make it yourself or buy a nice commercial one, but make sure it is large enough to hold all of the components. Consider the depth the meter goes back into the box to make it easy to work in. (fig 5)

With the works wired up in the box, it's time to check it out. Before plugging in, the mains primary should be checked with an Ohm-meter for continuity via the on/off switch. You should see 20 to 30 Ohms across the active and neutral of the three-pin plug when you work the mains switch 'on', open circuit with it 'off'. Now, shift one of the leads of the Ohm-meter from the neutral pin to the earth pin and check for insulation to earth and active. Switch the Ohm-meter right up to the MOhm range. It should read 20 MOhm or more. The same with the neutral to earth. Repeat this with the power switch in the 'on' position. Anything below 10 MOhms indicates a dangerous fault in the mains wiring. Correct it immediately before going any further. If in doubt, get someone more competent to check it for you.

Some may comment on the use of the MOhm range of the multi-meter being used with only low voltage to check the 240V insulation! Most home-brewers do not have a 500V 'megger', and this at least checks the insulation on the 240V wiring. If there is an error in the mains wiring, it will show up.

With the 240 mains okay, you can check the 30V AC at the motor switch. Set the multi-meter to 50V AC, connect one test lead to the common of the motor terminals, then check and see if the 30V AC appears at the terminals as the switch is moved each side for CW and CCW operation. The LED connected to the motor circuit should light, but only on one position, as you do not have the rotator and its capacitor connected. If this is okay, you can now check the 12V DC circuit.

With the multi-meter set up to the 30V DC range, check the voltage at the 1000

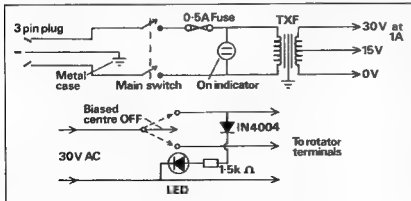


Fig 3

DELTA LOOP FOR 80, 40, 20 AND 10

HERB UNGER VK2UJ EL RANCHO ALECTOWN VIA PARKES 2870

After experimenting with most types of wire antennas for about half a century I found the Delta Loop a little ahead of all the others. How can I prove this?

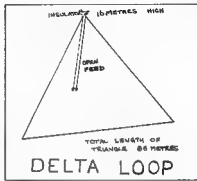
I have a switching system in my shack consisting of three double-pole, double-throw knife switches to which can be connected six different antennas and by tuning in both DX and local stations it is easy to compare signal strengths and the Delta Loop finished easily the winner.

Using the formula for Delta Loops: Length (feet) = $1000/\text{frequency (MHz)}$ the frequency of 3.55 MHz works out at 283 feet (86 metres) total length of a triangle of wire, making it possible to use 40, 20 and

10-metre bands as well as 80 in harmonic relationship.

This antenna is outstanding for DX as well as locals. It was originally an inverted V, and converting it to a Delta Loop gave improved performance. It is fed with open wire feeder to the top of the triangle 50 feet high so that radiation commences at the highest point.

This is a very simple and effective antenna for all bands requiring only one pole. The bottom only needs to be eight or 10 feet (three metres) above ground and the corners can be attached to a low tree or post.



Continued from page 22

μF, capacitor. It should be 25 Volts or more. Check the voltage the other side of the regulator IC. Set it to 12 Volts if possible with your circuit. If it is fixed, it should be the set voltage. All being okay, obtain (from your junk box) a potentiometer of value approximately the same as in your rotator, eg 500 Ohm to 1k Ohm. Solder three off 300mm wires to the terminals and identify them in some way. The same colours as the rotator control cable will make it easy. Switch off the power and connect the three wires up to the correct terminals +12V, wiper to the meter +, 0V return. Switch on and observe the Voltmeter. It should read somewhere between 0V and full scale, provided you have selected the correct value of multiplier resistor and trimpot. If okay, rotate the temporary potentiometer. The meter should go from 0 to full scale. Should it go over scale at one extreme of the testpot, adjust the trimpot multiplier for FSD. Now, as you rotate the testpot, the meter should go from 0 to FSD, corresponding to south, west, north, east and south for your rotator and its motor drive pot.

Now comes the big test. Connect up the rotators, either with some temporary wires a couple of metres long, or the multi-core cable you will use for the job. You can use your plug and socket as suggested. Plug it in, switch it on and look for smoke!!! All being okay, try the rotator control switch. The indicator LED should light, the Voltmeter should read somewhere on the scale and move up and down. Check that the rotator goes clockwise for CW on the switch, and counter-clockwise for the CCW position of the switch. It should stop at each extreme, either with the limit switches or just stall.

You can now decide how to label your Voltmeter in SWNES according to the way the rotator goes. Caution! It's easy to get your W&E transposed, and your

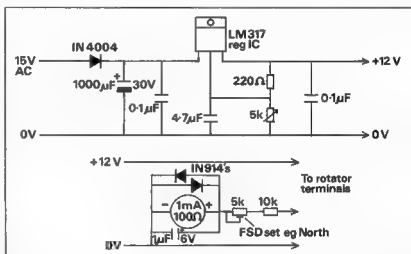


Fig 4

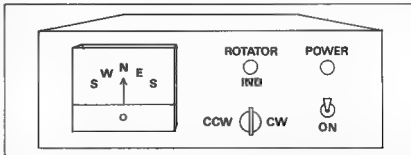


Fig 5

antenna 180° out. The rub-on dry transfer letters are ideal. They can be used for the power switch, CCW and CW switches, and the LED indicator. Depending on the design of the mA meter, you may be able to remove the front cover and then the scale to apply the SWNES letters. (Fig 5) You may have to remove it from the case to get to the scale. Watch the pointer

needle and the meter movement. Again, if you are not confident, get some help.

You can even give it a name; don't call it an "aimer", that's mine! Thanks to my good wife Sue for her suggestion.

You now have a usable rotator and a controller you can understand and even repair if necessary. Limited help will be given via a SASE QTHR in the Callbook.

"The Outbacker"

- ALL BANDS IN ONE NEAT ANTENNA
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The antenna is constructed of fibreglass with copper helical windings. The exterior is covered with a coating of epoxy and urethane for added strength, durability and protection. Tap points or frequencies are clearly engraved for each band. Sockets are made from brass, nickel-plated.

The wander lead is used for quick, easy, manual band changing — just plug one end into the lowest socket, wind the remainder clockwise around the antenna and plug the other end into the required frequency. Fine tuning for any resonant frequency within each band is made via the adjusting spike at the top of the antenna.

The optional mounting base and spring is made of solid brass, nickel-plating and the spring is zinc-plated spring steel.

An SO-239 is mounted on the side for feed termination. At the bottom of the base a threaded 1/2" hole is used for mounting to the vehicle, via a suitable adaptor (not supplied).

All Outbacker antennas are capable of handling 300 Watts PEP.

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B 80L-80M-80U-40-20-15-10 Metre	...\$266.40
C 80-40-20-15-11-10 Metre	...\$255.00
D 80-40-20-15-10 Metre	...\$247.00
E 160-80-40 Metre	...\$214.00
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Extra Frequencies Commercial — RFDS Etc	...\$27.00
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WHERE DO YOU SEND THE NEW WIA MEMBER APPLICATION? Send the application, together with the full membership fee as shown on page 3 of Amateur Radio magazine, to your local WIA Division.

HOW DOES YOUR CLUB CLAIM ITS FEE? The club secretary writes, on club letterhead, to "WIA Club Contest, PO box 300, Caulfield South, 3162" with details of the new WIA member. At the end of each month of the contest a cheque for the total amount of all \$5.00 recruitment fee due to the radio club will be forwarded.

The club which wins the grand prize of a free three year membership of the WIA, plus books for the club library, for signing up the most new WIA members, will be announced in February 1991.

Get to work now in this great fund raising contest where everybody is a winner!

TA

LAND OF THE HORNBILL WELCOMES SEANET AMATEURS

INFORMATION RECEIVED VIA TOM KING VK2ATJ PO Box 140 KENSINGTON 2033

Amateur radio operators from around the world are making preparations to attend the 18th annual SeaNet Convention set for the weekend of 10, 11 and 12 November in Kuching, Sarawak, East Malaysia.

About 200 amateurs from a dozen countries are expected to attend the annual South East Asia Net Convention which is being organised by the newly established Sarawak Division of the Malaysian Amateur Radio Transmitting Society.

Venue for this year's SeaNet convention is the luxurious Sarawak River-sited Holiday Inn Kuching. The registration fee of \$M150, or about \$A70, includes a cocktail reception on the Friday evening, a hosted lunch on Saturday and a gala banquet on Saturday. Numerous door prizes will be presented at the fun-filled dinner.

The Chief Minister of Sarawak, Datuk Patinggi Tan Sri Haji Abdul Taib Mahum, will open the convention at 10am on Saturday, 10 November and then will host the lunch.

The highlight of the conference is expected to be the presentation of a pa-

per on the "Future of Amateur Radio in Relation to WARC 1992" by Richard Baldwin, W1RU, the President of the International Amateur Radio Union.

An invitation has also been made to the President of the Japan Amateur Radio Club. In addition, convention discussions will likely include a presentation on Malaysia's advanced telecommunications system.

A special event amateur station set up at the Holiday Inn Kuching is expected to use the callsign 9M8SEA. Special QSL cards will be sent to confirm contacts.

Sufficient time will also be provided for delegates to conduct their own eyeball QSOs. As recent SeaNet conventions have drawn amateurs from the six ASEAN nations: Singapore, Brunei, Malaysia, Thailand, the Philippines and Indonesia as well as enthusiasts from Japan, the USA, Australia, New Zealand, Canada, England, Germany, Sweden, Hong Kong, India and Sri Lanka there is ample opportunity for radio hobbyists to discuss problems and progress as well as techniques and technology.

Following the convention a three-day post conference tour and DXpedition is

scheduled to the world famous Mulu Caves in the heart of tropical northern Sarawak. The tour price of \$M720 or \$A340 includes return flights on Malaysia Airlines, boat trips, food and hotel.

Another special event station will be established for the first time ever at these remote caves which are located on the summit of a 1600m limestone hill. Wildlife to be seen during the exotic excursion may well include the elusive orangutan and the hornbill, the odd billed bird depicted on the state's crest.

Written information about SeaNet can be obtained from the MARTS-Sarawak Honorary Secretary, Mr Festus Havelock 9M8FH, 421 Cross Road, 93150 Kuching, Sarawak, East Malaysia.

Amateurs can obtain details from the daily SeaNet session on 14.320/+/- QRM at 1200 GMT. All amateurs, regardless of their QTH, are invited to check into SeaNet and then match up faces behind the voices at this year's Kuching radioactive get-together. **ar**

TECHNICAL CORRESPONDENCE ABOUT RESISTORS

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DRIVE SOMERVILLE 3912

They are our commonest circuit component, and our cheapest. They can suffer from overloading, loss of end-caps and open circuits. It is a wide band passive device covering from DC to 10s of MHz, its performance only limited by parasitic L&C. In spite of these we can, with appropriate loading, produce excellent dividing circuits that can handle 20MHz square waves without trouble. Unless attempting wide band design it is easier to work with lower values and accept the modified performance. A summation of phase shifts and change of feedback sign will send us back to basics!

Speaking of basics, do you still remember that formula you 'mugged up'

for the exam? It went E²-RW. Yes, it was included because it is useful. Consider a familiar 1k 1/3 W and analyse the potential. A few stabs at the calculator tells us full load is 17 Volts. The manufacturer, well sometimes, tells us the device should be run at 1/10 rating for good stability and reduced long-term drift, that's 5-1/2V. At higher values, 10k@18V, 100k@55V. It follows that in normal transistor circuits 3.3k and higher are loafing.

From 1k down, more calculations from your theory exam are the route to happy resistor life. A stable resistor network in any design is an excellent starting point for long life in the semi-conductors, and they cost more! Paralleling several resis-

tors on a circuit board will reduce the bulk of a higher wattage resistor and give a greater 'heatsink'. Series resistors can be used if you have low values handy. A simple move is to connect four in series/parallel, this gives the same value and four times the wattage. You can, of course, use four of these S&P networks to make another S&P — still the same value, 16 by 1/3 = 5-1/3 W and they said they were unobtainable! Three 3.3k in series for a 10k, 1W or in parallel for 1.1k @ 1W.

Ham radio is about finding solutions — I couldn't resist doing this note!

73 AR SK VK3XZ

AWARDS

PHILL HARDSTAFF VK3JFE
FEDERAL AWARDS MANAGER

Postcode Award

First up this month news of a new Australian award comes to me via Bill Horner VK4MWZ. This is the Australian Amateur Radio Postcode Club (Award). The following are the rules for this award:

Australian Amateur Radio Postcode Club (Award)

- This award is open to all amateurs and SWLs
- All contacts made after 31.08.90 will be eligible
- This award will have various levels (CLUBS), and each club will receive a certificate. The clubs are as follows. POST-CODES — 100, 250, 500, 750, 1000, 1500, 2000, 2500 (provision to extend)
- The 100 club shall consist of one postcode per alphabetical letter, plus 75 random postcodes (nil for X).
- Portable operation is encouraged with only five contacts required to claim each postcode. Australia Post prints a FREE postcode listing booklet which is available from post offices throughout Australia
- All legitimate modes may be used — LF, HF, VHF, UHF, Oscar, EME etc.
- No crossband modes and nil via repeaters.
- All bands, including WARC, may be used.
- All certificates will be endorsed
- Weekly nets will be held every Sunday at 09.00 UTC on 28.480 MHz, followed by 10.000 UTC on 3.596 MHz
- The cost of these awards (each certificate) will be \$A2.00 for all VKs, \$US2.00 for all ZL/P29 areas and \$US3.00 for all DX.
- A copy of your log is to be submitted upon application for awards and sent to:

AARPC Awards Manager
28 Iron Street

GYMPIE WA AUSTRALIA 4670

Unfortunately, no sample award made it to me, so if you would like to send one to me, Bill, I will try to fit it as soon as practicable. I like the concept of this award and encourage you to have a go.

Overdue Awards

The issuing of awards will be held over until next month as I spent quite a few nights this month putting together the draft rules for the Grid Square Award. So, if you are expecting an award, please be patient. I even envisage getting started on the DXCC updates etc next month

Grid Square Award

Well, the time has come to finally get this

thing off the ground. I now know how a politician must feel when trying to put together a piece of legislation, trying to please everyone and upset no-one. Of course, this is not the reality, and I know it will not be possible to please everyone! I thank all those who contributed, either over the phone or by mail, in particular — VK3BRZ, VK3KKW and VK3ZJC

After going through all of your letters, I have taken bite and pieces and tried to put them together into something that reflects what you are seeking to have introduced. I know what I present here will not make everyone happy, but at the same time I wish to make it clear that the rules as presented here are **draft** rules and are not final. I need input from you over the next month (up until 28 October; this gives me seven days before the November AR deadline to have something in the next column)

There were a couple of items that I feel will create a bit of controversy. These are to QSL or not to QSL, and the reciprocal rule. As it seems to be a majority view by those who did contribute that QSL cards should not be needed, that is how it is presented at the moment, and we will see what I get in the way of feedback. The reciprocal rule I think is a logical one and shouldn't meet with too much resistance. Put simply, it means that if you go portable to a rare grid square and manage to work someone in your own home grid square, you will receive credit for the rare grid square (these types of contacts are limited to 75 per cent of the contacts required).

It was also suggested that this be an Australian Grid Square only Award, ie contacts only with stations in grid squares in Australian territory. Well, that's how I am presenting it at the moment, because that's all anyone has suggested so far.

HF or VHF?

I also noted that when Ken originally suggested the idea in April 1989 (p 19) AR, he was talking only about HF. All the letters I received were from dedicated VHF operators, so there seems to be more interest from the VHF operators than the HF ones. However, I have never been in favour of separate HF and VHF awards. In my view, an award is an award, and no award should have band restrictions placed upon it and, as a consequence, neither will this one. The only difference is that it will be just a little easier to obtain on some of the higher bands.

Endorsements

Yes, there will be endorsements (eg CW only, 2KSSB, 50 MHz etc). There will be

stickers available for updates, but the multiple will be limited to keep down the costs for stickers. I haven't yet quite decided how this will operate — but, plenty of time for that.

Start Date

It was suggested by a couple of correspondents that the start date should be made retrospective, so as to give it a bit of a "kick start". I agree with this concept and propose 01.01.90 as the start date, as it was originally hoped to have the award going by then. I don't see any problems with this, but again would like to encourage your views on the subject.

Name?

Always a hard one but, in this case, I think the default name "WIA GRID SQUARE AWARD" or "WIA GSA" as many people who have written to me have called it, is a suitable name and unless someone can come up with something better, this will be it.

I have steered clear of having either the words "Century" or "100" in the name as I believe these have already been 'thrashed to death' in other awards, and, as it will be available for a lesser amount in the higher bands, I see no reason to include them in the name — what do you think?

Design

Any person who would like to reveal his or her creative skills by having a go at designing a suitable award, then please put your pen to paper. I would stipulate only the following criteria.

- that it be based upon an Australian theme;
- the words 'WIA' be prominent;
- a clear indication to recipients that it is related to locators

Even if you're not a graphic artist but have a good basic idea, then submit a rough example and I will attempt to make it clear and presentable.

I would also like to try to make it fairly colourful, but this of course depends on funding. If anyone knows of any commercial interest which may be willing to sponsor a certificate without wanting its name in 'highlights', then please let me know.

Standings

I also anticipate having updates every so often, of say, the top scorers, circa five on each band or similar, so people can see just what is possible and what is being achieved. This may encourage those who think they will never reach their target. It will also give those who like a bit of competition something to aim for

So, here are the draft rules:

1. a) The Wireless Institute of Australia Grid Square Award (WIA GSA) is awarded for contact with a minimum number of "Maidenhead" 2 degree x 1 degree grid square locators per band as indicated in (b). Grid Squares are

designated by a combination of two letters and two numbers. (Refer to Awards column September 1990 for information on Locator Atlas).

b) The minimum number of squares needed to initially qualify for each individual band awards is as follows: all HF bands including WARC bands — 100, 50 MHz-75, 144 MHz-50, 432 MHz-25, 1296 MHz-10, 2420 MHz-5, all bands above -5

2. Only contacts made on or after 1 January 1990 are creditable for this award.

3. a) Individual band awards are endor-seable in the following increments:

- All HF bands — 25
- 50 MHz + 144 — 10
- 432 MHz + all bands above — 5

b) Separate bands are considered as separate awards.

4. a) No crossband contacts permitted

b) No contacts through active repeater or satellite devices or any other relay method permitted

c) Contacts with aeronautical or maritime mobile stations do not count.

5. Stations which operate portable from a different locator to their "home" locator and work a station located in their "home" locator shall receive credit for the locator from which they are operating portable, limited to an amount equal to 75 per cent of total number of contacts required for a basic award.

6. a) All contacts for all of the individual band awards must be made from a location or locations, within the same grid square or locations in different grid squares no more than 25 miles apart. Excepting contacts made under the provisions of Rule 5. Note: (This provision is included because, say for example, you lived in the southern suburbs of Melbourne and then moved to the northern suburbs, chances are you moved from QF21 to QF22, but moved less than 25 miles, so you needn't start again).

b) If an award is claimed for contacts made from different grid squares as per 6(a) the grid square from which the majority of contacts are made shall be referred to as the "home" locator for Rule 5.

c) All contacts for this award must be made with stations located in Australia as defined by DXCC rules. (ie if a station is in Australia for DXCC purposes it is a valid contact for this award).

7. Only the following endorsements are available:

- "CW ONLY"
- "ALL TWO WAY SSB"
- "MIXED"
- BAND ENDORSEMENT.

8. a) QSL cards are not required. A certified log extract should be provided with the following information: date, time, call sign, mode, frequency, grid locator and signal report sent by the station concerned. This list should be certified by an official at a society affiliated with the WIA or by two licensed amateurs

reading as follows — "I/we certify that the enclosed list corresponds with the information contained in the said logbook".

b) For those who would have difficulty in getting a certified list, photocopies of your logbook signed by the applicant certifying all the information contained within to be true and accurate can be certified by the Awards Manager. NOTE: All entries must be legible.

9. The cost for each award is \$A5.00 or eight IRCs for amateurs in Australia, or \$US5.00 or eight IRCs for those outside Australia. Requests for endorsements should be accompanied by an SASE or one IRC and SAE.

10. This award is very much dependent upon the honesty of the operator. Any fraudulent applications will result in the disqualification of the applicant from all future WIA GSAs.

11. All decisions regarding interpretation of the rules here printed made by the Federal Awards Manager are final and binding.

Well, there you have it! I hope not too complicated? If you can't get pen to paper but would like to have some input, you can phone me on (03) 434 8424 after 7.30pm on week-days. Remember — these are draft rules only; if you don't like some aspect of them, then outline your objections and reasons and contact me.

Two other projects I will be attempting — an application information package for this award, consisting of a locator map of Australia and record book, plus an application form. This should make it easier to keep track of contacts.

ALL THE BEST UNTIL NEXT MONTH. 73 PHIL VK3JFE

Radio Scouting Awards

The New South Wales branch of the Scout Association makes two awards available to amateurs, Scouts and Guides in recognition of achieving communications with Amateur Scout and Amateur Guide stations. These are the "Radio Scouting Award" for making contact with Scout and Guide stations in all States of Australia, and the "JOTA Award" for making contact with amateur, Scout or Guide stations in the State of New South Wales during the Jamboree on the Air.

If you require further information, or would like to make application for these awards, then please write to:

Branch Activity Leader, JOTA,
The Scout Association of Australia,
NSW Branch,
PO Box 115, HABERFIELD 2045.

General Rules for all NSW Branch Radio Scouting Awards

1. Verifications

1.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence, from

the station contacted, showing that two-way communication has taken place.

1.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.

1.3 Each verification must show the date and time of contact, type of emission and frequency band used, the report and location or address of the station at the time of contact.

1.4 A checklist must accompany every application setting out the following details.

(a) Applicant's name, callsign and the name of the Scout/Guide group, if applicable

(b) Where applicable, the date of change of callsign(s) and details of previous callsign(s).

(c) Details of each contact as required in Rule 1.3.

(d) The applicant's address/location at the time of each contact if land/portable/land mobile or marine mobile operation was involved.

(e) The callsign of the station worked.

(f) Any relevant details of any contact about which some doubt may exist.

1.5 In lieu of forwarding QSL cards or other written evidence as set out in Rules 1.1 to 1.4, a list giving details set out in Rule 1.3 (Log Extract), certified by the following will be acceptable.

The Awards Manager or a council member of the Wireless Institute of Australia (or affiliated society in the case of overseas amateur stations)

The Area Radio Activities Co-ordinator and the District Commissioner, or

Two licensed amateurs known to the applicant.

Each person certifying an award application must sign the following declaration:

"I have checked the (insert number in words) QSLs submitted by (insert name and callsign of applicant) and certify that the details attached correspond with the verifications inspected by me.

Signed "

2. Applications

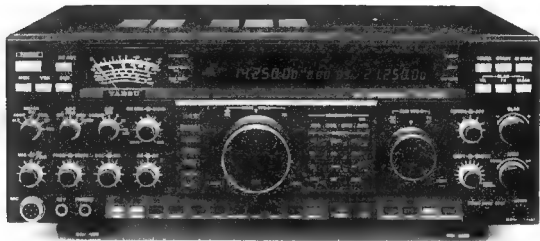
2.1 Applications for the awards should be addressed to the Branch Activity Leader, JOTA, accompanied by the verifications and checklist, with sufficient postage enclosed for their return to the applicant.

2.2 No charge will be made for the issue of certificates. However, an amount of \$3.00 or five IRCs per application will be charged to cover postage of certificates. Cheques should be made out in the name of "The Scout Association of New South Wales" and forwarded with the application.

2.3 Successful applicants will be listed periodically in "Australian Scout".

2.4 In all cases of dispute, the decision of

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Due to the huge worldwide demand, initial stocks of the FT-1000 will be limited. So place your order now! *

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There are also 21 tuneable memories and 2 VFO's per band, plus inbuilt C.T.C.S.S. (Tone Squelch, encode/decode) with paging facility, a variety of scanning facilities, LCD display showing 5.5 frequency digits on both bands at the same time, and an LCD bargraph signal/P.O. meter. The programmable 'power saver' system helps maximize battery life, and frequency selection via tuning knob or direct keyboard entry is a standard feature. Comes complete with an ultra long-life 1000mAh NiCd battery pack, carry case, dual band antenna, and an approved AC charger.

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Cat D-3360

See A.R.A. review Vol 12, Issue 5, or A.R. review Aug '89 issue.

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the Radio Activities Branch Advisory Committee in the interpretation and application of these rules shall be final and binding.

2.5 Notwithstanding anything to the contrary in these rules, the Radio Activities Branch Advisory Committee of the Scout Association, NSW Branch, reserves the right to amend them when necessary.

Radio Scouting Award

1. Objectives

1.1 This award, to be known as the "Radio Scouting Award", is offered by the NSW branch as tangible evidence of the proficiency of Australian and overseas amateurs, including amateur Scouts and amateur Guides, in making contacts with Scouts and Guides in all States in the Commonwealth of Australia.

1.2 The award may be claimed by any amateur, amateur Scout or Amateur guide or Scout/Guide group in Australia or outside of Australia.

2. Requirements

2.1 A certificate will be awarded to any applicant who makes contact with Australian amateur Scout or Guide stations in the areas listed below.

2.2 All contacts can be made on a single band, ie six metres, 10 metres, 15 metres, 20 metres, 40 metres, 80 metres etc. Multi-band operations on the high frequency bands will be accepted, and certificates will be endorsed with the word "multi" to reflect this type of operation.

2.3 A separate application must be made for each band.

State	Call Area	QSOs Required	O'ceas	Aust.
ACT	VK1	1	1	
New South Wales	VK2	2	5	
Victoria	VK3	2	5	
Queensland	VK4	2	5	
South Australia	VK5	2	5	
Western Australia	VK6	2	3	
Tasmania	VK7	1	2	
Northern Territory	VK8	1	1	
		14	27	

3. Operation

3.1 All contacts for this award must have been made on or after 20 October 1990.

3.2 Contacts may be made using any authorised frequency band or type of emission permitted to Australian amateurs, but crossband contacts will not be permitted, except in the case of "Outback JOTA" stations operating on the Schools of the Air or Royal Flying Doctor Services, when authorised by the Department of Transport and Communications.

3.3 Repeat QSOs with the same station will count provided at least 24 hours has elapsed between each QSO.

3.4 Any authorised mode will qualify, however, there will not be separate awards for each mode.

JOTA Award

1. Objectives

1.1 This award, to be known as the "JOTA Award", is offered by the Scout Association of Australia, New South Wales Branch as tangible evidence of the proficiency of amateur, amateur Scout and amateur Guide stations in making contacts with New South Wales stations during the Jamboree on the Air.

1.2 The award may be claimed by any amateur, Scout, Guide, unit or group.

2. Requirements

2.1 A certificate will be awarded to any applicant who makes contact with any four amateur JOTA stations operating in the 12 Scout areas of Central Sydney, Cumberland, Hume, Manly-Warringah, Newcastle and Hunter, North West, Riverina, St George, South Coast and The Golden West.

2.2 Only one contact per area may be counted for this award.

2.3 Each contact must have a minimum duration of 15 minutes, and information must be exchanged with members of either the Scout Association or the Girl Guides Association.

2.4 In any four stations contacted, one station must be either a Girl Guide or Scout station.

For example: where three Scout stations have been contacted, one each in Hume, Hunter and Riverina, the fourth must be a Girl Guides station.

2.5 Stations operating under the call sign of an amateur assisting Scouts or Girl Guides during the Jamboree on the Air are eligible for this award.

3. Operation

3.1 Contacts for this award must have been made from 0001 UTC on the first day of the Jamboree, ie Saturday to 1000 UTC on the last day of the Jamboree, ie Sunday.

3.2 Contacts made on or after 20 October 1990 will be eligible for this award.

3.3 Contacts may be made using any authorised frequency band or emission permitted to Australian amateurs. Cross-band contacts will be allowed, including contacts made with "Outback JOTA" stations using Schools of the Air or Royal Flying Doctor Services authorised by the Department of Transport and Communications.

3.4 Contacts made through terrestrial repeaters or through satellite (AUSSAT) links will be permitted.

3.5 Where contacts are made using a mixture of HF, VHF and UHF bands, certificates will be endorsed with the word "multi" to reflect this type of operation.

3.6 No contact made with ship or aircraft stations in Australia will be eligible, UNLESS they are operated by either Sea Scouts or Air Scouts, but land-mobile and portable stations may be contacted provided the location at the time of contact is shown on the confirmation.

ROBERT DEMKIWK2ZENU,

BRANCH ACTIVITY LEADER

JOTA

BY

CONTESTS

KEN MILLER VK2GKM
NOVICE CONTEST MANAGER

Results of WIA 1990 Novice Contest

Entries in the phone section of this year's contest totalled 34, with 10 in the CW section and two SWL entries. Logs were generally of a high standard with few incorrect or duplicate contacts being recorded.

The Keith Howard VK2AKX Trophy will be awarded this year to VK4VAT for the

highest aggregate novice score.

The Olive Burns Memorial Trophy for the novice entrant with the highest CW score has been won by VK3PTB.

Both of these perpetual trophies are held on permanent display at the Executive Office. However, in each case the winner will receive a suitably inscribed wall plaque.

Section A Novice Winner	VK4VAT	1186
Section A AOCF Winner	VK1PJ	1228
Section B Novice Winner	VK3PTB	320
Section B AOCF Winner	VK4OD	101
Section C SWL	VK3 LL80037	1453

Individual Scores — Section A

VK1PJ	1228	VK3MNC	852
VK4VAT	1171	VK5QX	750
VK6ANC	1038	VK4BY	626
VK6MMH	1006	VK3GH	597
VK5NOD	996	VK7NNN	585
VK2ZL	923	VK8AV	563
VK4VMP	896	VK5AFO	559
VK3APC	857	VK2LE	414

ZL2TJS	333	VK2SRM	181
VK6BB	290	VK2KTV	171
VK4AVR	275	VK1RH	158
VK1EV	268	VK5KNJ	157
VK2LEE	243	VK2PSW	156
VK4IS	221	VK2KJD	150
VK1BBA	205	VK7FD	126
VK1BR	187	VK3MDJ	82
VK4LAE	182		

Individual Scores Section B (CW)

VK3PTB	320	VK8AV	69
VK4VXK	203	VK6AF	55
VK4OD	101	VK4NEF	44
VK7FN	73	VK5NOD	41
VK4YB	71	VK4VAT	15

Individual Scores Section C (SWL)

VK3	L30037	1453
VK4	L40018	331

Additional Certificates Recommended

For the highest aggregate novice score for each State excluding national winners.

VK1 —	VK6MMM
VK2LEE	VK7NNN
VK3MCN	VK8 —
VK4VMP	ZL2TJS
VK5NOD	

Other special awards recommended:

Section A	Section B
VK6ANC	VK4VXX
VK2ZL	
VK3APC	

Comments Received with the Entries Were:

"Great contest — I will be in it next time with a new power supply (mine blew up half-way through)."

"I had an enjoyable time — best of luck to the winners."

"Club stations need to keep modulation down to 100 per cent, the available bandwidth on 80 metres is small enough at contest times."

"I always enjoy this contest — it is great to be able to give other operators the 10 points for a club contact. I recommend that the old method of identifying club stations be resurrected."

"A thoroughly enjoyable fun contest. ZL turnout was disappointing, but understandable, as the contest was not advertised in 'Break-In'."

"I enjoyed the contest greatly and found all operators friendly and courteous."

"I enjoyed the contest and look forward to the next one."

"Conditions were good and the going was leisurely. Enjoyed it very much."

"Had a great weekend, but had one problem — the extremely uncomfortable 'fobbing off' of non-VK, ZL and P2 stations."

Suggest either —

1. Allow overseas contacts (full call points).
2. Allow contacts by anyone but 0 points.

Sunshine State Jack Files Memorial Contest 1990

Results

Section 3, stations within VE4

a) TX All Band	
VK4ACC	1079
VK4CHS	262
b) TX HF Phone	
VK4MWZ/M	2133
VK4AVR	1016
VK4BB	856
VK4VMP	910
VK4NEF	862
VK4DRM	837
VK4EHW	647
VK4NSB/M	641
VK4KYV/M	624
VK4IS	287
VK4MCY/P	254
VK4PJ	155
VK4POM/M	147
d. TX VHF Only	
VK4NLV/M	25
e. Club Stations	
VK4WIE/M	2827
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Section 4, Stations Outside VE4

a) TX All Bands Phone	
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Comments

As now appears the normal practice, there were more participants than logs received. It was particularly pleasing to have logs from 'newer' amateurs, several stating that this their first contest — well done, and a good job they made of it too.

Thanks to the participants for their constructive comments; where possible they will be acted upon. For those who spoke of the time slot, be advised that this matter exercises me too. For interest, the participation by time this year was:

Hour	Percentage of participation, ie contacts
05-06	12%
06-07	17%
07-08	17%
08-09	15%
09-10	17%
10-11	20%

TED MULHOLLAND VK4AEM
VK4 DIVISION CONTEST MANAGER



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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

I am writing these notes on an early sunny September day. One hopes that the spring equinox will change band conditions for the better, as the sun moves southwards from the equator

Albania ZA

The saga continues. Early August it was reported that Peter HA5WE returned from Albania, saying he was advised by a high government official (some even say it was the Albanian Prime Minister himself) to postpone the planned activity until September, when things will be "quieter". My direct source from Hungary advises that the President of Albania is expected on an official State visit to Hungary in September, and the amateur DXpedition will take place after that political event. Well, we will see...

Kuwait-9K — and the Middle East

If you are one of the many DXers who delayed sending the QSL cards to 9K2CS for the Yemeni 701AA operation, you are too late! Even those who sent their cards in the latter part of July will be disappointed. Mohamed 9K2CS, the leader of the Yemeni operation, was related to the Kuwait Royal Family. His whereabouts are known. Some sources say he was killed with several members of the Al-Sabah family. Other, allegedly

well-connected sources, say that he and his father 9K2KS are alive and well in Saudi Arabia... but the logbooks were left behind in Kuwait.

The ARRL DXCC still has to decide whether the 701AA activity refers to one of the two old Yemeni states, or to the new one after the merger? Please do not send your cards, if you are one of the lucky ones who has received a card, to the DXCC until further notice.

The French activity in Yemen 708AA finished its operation on 12 August. QSL to F6VX (See Sept AR).

Further on Yemen. According to some other reports, the callign group from 701 to 705 will be allocated to Yemeni amateurs, the 707AA group will be allocated to club stations, and the 708AA group will be used by foreign visiting amateurs.

If you listened on the various DX nets during August, you would have heard that the club station Y1BGD was active on 11 and 18 August, on the latter occasion with a YL operator named Alar. There were very few takers for a QSO. Other DX stations active in the Middle East were YK1AA, A41KL and A41KJ.

Look out for a new Saudi Arab station 721AB. This is the callign assigned to the Amateur Radio Society at the US Embassy in the capital of Saudi Arabia, Riyadh.

Rwanda 9X

There are now five active resident amateurs in this country, most of them on work-contract basis. Wolf 9X5SW was heard on 21 MHz. QSL to DK5QB. The other active station is 9X5HG. The operator is Hartmut. His home call is DK2SC, and his QSL manager is DJ3FW W Wenske, Lindenkamp 27, D-2060, Bad Oldeolhe, West Germany. Hartmut is a frequent visitor on the "ANZA" net (21205 kHz) with usually a strong signal on longpath to Sydney. He is a professional radio engineer and his wife is with him in Rwanda. He is one of the technicians who work on a shiftwork basis for a German relay broadcast station in Rwanda. He lives on a 1500m hill, only about 300m from the broadcast station and this sometimes creates local QRM problems for him. Hartmut said it took six months patient waiting to secure a licence, and he started operating at the beginning of August. He is using 400 Watts into a HB9CV two-element beam.

The Colvins

Iris W6QL and Lloyd W6KG are on the air again from Africa. This time from Tanzania

as 5H0QL. They plan to operate from other African countries which they have not visited before. They would like to go to Mozambique (C9) and to Madagascar (5R) but, as of now, they do not have permission to operate. Iris had a reasonable signal to VK2 on the "ANZA" net, and she sends greetings to her VK friends whom she met when they visited her in February. QSL to YASME Foundation, Box 2025, Castro Valley, CA 94546.

"Zbig" VK2EKY — and the Pacific

Received a long letter and several photos from Zbig, who was active in recent months as KH8/VK2EKY, 5W1KY, A35KY, ZK3EKY. I commented on Zbig's travels in previous issues of 'AR' and quoted him as an "ex-VK2EKY". Of course, this was one of those slips of the tongue or, rather, the pen. Zbig is very much a resident of VK2, and a local amateur, except that he has the good fortune to travel widely. He started his DX activity in 1971 as SP5EKY but went QRT with that callign in December 1981. After travelling around the world he arrived in VK2 in June 1985, decided to stay and, soon after, obtained the call VK2EKY. His Pacific wanderings started in 1987 in ZK2, KH8, 5W1, A35 and 7J1. A year ago he met his wife, Kayoko from Japan, who was often mistaken on their recent Pacific tour, for Kyoko, another Pacific DX operator from Japan.

Zbig returned to Sydney at the end of July, but 10 days later he was in Guam and I had a chat with him on 14 August, operating as KH2/VK2EKY. Zbig is going from there to Tokyo and Osaka where he hopes to operate from the 6J90EXPO club station.

Zbig plans to stay a while in Japan with his in-laws and will operate from there as 7J6AAK. He says he will build a "big" Yagi, three elements on 7 MHz. He sends greetings to all his friends who worked him on the various bands.



The well known Pacific traveller "Zbig" VK2EKY also known as KH8/VK2EKY, 5W1KY, A35KY, VK2EKY/KH2 and 7J6AAK seen here at Tokelau operating as ZK3EKY



Memories of the recent Bhutan DXpedition. Jim A51JS (VK9NS) and Prahan A51PN with the Butternut vertical in front of the hotel

Christmas Island VK9X?

Harry VK2RQ (better known under his old call sign as VK2BJL) is planning a DXpedition to Christmas Island (Indian Ocean) mid-October. Other participants are Franz DJ9ZB and Bruce VK3DHT. However, the trip depends very much on the availability of accommodation on the island. If this cannot be solved, the October trip will be abandoned and rescheduled for March next year. Harry by the way, is a known DXer. He was on Spratly in 1979, on Melish Reef in 1978 and 1982 and on Tokelau in 1981.

Bing, VK2BCH and the Pacific

Last year, Bing had to return home from his Rotuma DXpedition as a sick man. He recovered and decided to go back once more. He is leaving on 18 October for Fiji 3D2, then to Tonga A35 and, finally, to Rotuma as 3D2XV.

Malpelo Islands HK0

Fifteen Colombian operators belonging to the Colombian Radio Amateur League will operate from this tiny island in the Pacific Ocean about 350 km west of the city of Buenaventura. The expedition will take place between 3 and 7 November, but it depends very much on transportation facilities which the group hopes that the Colombian Navy will provide. The operation will be on all bands, CW, SSB, RTTY. The frequencies quoted are: 1825, 3605, 7005, 14025, 21025 and 28025 for CW. For SSB they are: 1835, 3795, 7085, 14145, 21195 and 28395. QSL via the Bureau or to HK3DDD. Edilberto Rojas M, PO Box 25827, Bogota 1, Colombia, with the usual SAE, IRLs or "green" stamp.

South Georgia and South Sandwich DXpedition VP8SGI and VP8SSI

The charter of the ship "Indiana" will cost \$US90,000 for 30 days, including fuel and meal for the 20 operators, which includes two team doctors who are also amateurs. The air transportation cost for a return trip from Miami to Punta Arenas is \$US1173 per member. A number of commercial radio firms have made equipment donations, but the expedition badly needs cash support. Please send your donation, no matter how small, to Jerry Branson, 93787 Dorsey Lane, Junction City OR 97448 USA.

Interesting QSOs and QSL Information

Note the following call sign, name of operator, frequency in kHz; mode, UTC, month of operation. ADAR means QSL info in previous issue of 'AR'.

HC1XM Yeong — 7095 — SSB — 1020 — July QSL to: Change P Yeong Seong, URB

Santa Rosa 87, Box 197, Santo Domingo de los Colorados, Ecuador.

VS6VO — Graham — 21225 — SSB — 0940 — July QSL to: PO Box 12727 Hong Kong.

P2ZWG Willy — 28485 — SSB — 0011 — August. QSL to: Box 3383 Curacao, St. America.

HKOTCN — Vic — 14180 — SSB — 0928 — August. QSL to: Victor M Tesone, Box 464, San Andreas Island, Colombia.

9J2BO — Brian — 21132 — CW — 0847 — August. QSL via W6ORD: Box 19055, Encino CA 91416, 9055 USA.

3A2HB — Len — 21253 — SSB — August. QSL via Bureau.

H13PGJ Jose — 14238 — SSB — August. QSL via Bureau or to: Jose I Dominguez Luis Bogzaert 89, Santiago, Dominican Republic.

OY3QN — Ole — 21025 — CW — 0900 — QSL to: OZ1ACB, A L Andersen, Kagsavej 34, DK-2730 Herlev Denmark.

457CF — Cal — 14012 — CW — 1100. QSL to: 9V1JY N Vatheendran, Block 171, Bukit Ratok West, Av 8 23-349, Singapore 2365.

5N0ETP — 14222 — SSB — 0631 — QSL to: N6QLO Edward G Linsky Jr, PO Box 85, Burlingame CA 94010 USA.

YS0OR — 21296 — SSB — 0236 — July. QSL to: Box 976 San Salvador, El Salvador.

3DA0BK — 28485 — SSB — 0640 — July QSL to: Box 122, Evem Swanland.

ZL3TY — 60120 — SSB — 0154 — August. OX3ZM — Anny (YL) — 14226 — SSB — 1154 — August. QSL to: Ann Alice Rasmussen, Sanctorievej, Block 642, Box 380, DK-3920, Juhanehaab, Greenland.

7X5AB — Ali — 21205 — SSB — 0510 — August. QSL to: PO Box 137, 07000 Biskra, Algeria.

JS5CVF — 14222 — SSB — 0740 — August — QSL to: CT1DIZ Jose Alexandre C Barbosa, Baixa 66, Alguero P-2725, Mem Martins, Portugal.

JU750BV — Naran — 14251 — SSB — 1412 — August. QSL to: JT11BV, PO Box 106, Ulan Bator (Zip 51) Mongolia.

5RBJD — Jean Paul — 21205 — SSB — 0502 — August. QSL to: F6FNU Antoine Baldeck, Box 14, F-91291 Arpajon Cedex, France.

EKOAC — Alex — 14001 — CW — 1152 — August. QTH: Iony Island, Sea of Okhotsk, 56°26'N and 143°25'E. QSL: via Bureau to UA0OBA.

C56/DL7FT — Frank — 14195 — SSB — 0629 — August. QSL to home call via Bureau.

RTTY News

Thanks to Syd VK2SG for the following info:

HV3SJ — 14089 — 0557 — August. ***** FP5DX — 14089 — 0245 — August. QSL to: Box 4204 F-97500 St Pierre et Miquelon via France. ***** A41JW — 14088 — 0149 — August. QSL to: Aboulaziz Alla Baksh Al Balushi, Box 7421, Motrah, Oman. ***** ZD9BV — 21083 — 1700 — August — QSL to:

W4FRU. (Note: ZD9BV will have better signals after he finishes his house and his new beam) ***** J42DIO — 14089 — 2148 — August. QSL to: via SV2XYT, Box 10728 Tesalonika, 54110 Greece. ***** TY1PS — 14093 — 0055 — August. QSL to: Peter Schulz, BP-06-2535, Cotonou, Benin, Africa. ***** VQ9RB — 21093 — 1757 — July QSL to: Dick Barnes, Box 55, NSF, FPO, SF 96685 — 2000 USA. ***** JX9CAA — 14091 — 1130 — August. QSL via LA5NM, ***** 8P6MR — 14089 — 0208 — August. ***** It appears that whilst CW and SSB activity has stopped from Kuwait 9K2, RTTY activity was observed on 10, 17, 20 and 21 August on 21, 18 and 14 MHz.

From Here and There and Everywhere

Some time back in April I had a contact with an unusual call, VK6COM. The other day a nice colour certificate arrived from the City of Mandurah in Western Australia. Mandurah has been proclaimed a City and the station was a special event station.

The intended visit of Paul VP2EXX to the USSR has not taken place (See 'AR' Sept issue).

Al H4AAP has now recovered from his malaria attack and from the infected foot which needed surgical intervention and evacuation by air to Hawaii. Al is back in Honara and active as before.

The 3W3RR cards are arriving in VK from Rome, direct from the USSR. Nice design, good quality paper, but nowhere on the card is stated that it confirms a QSO or that it was a two-way contact. A bit disappointing.

In contrast, the 1S0XV cards are very professional. Good design and lots of information. Thanks to W4FRU for a very quick turnaround. W4FRU is also QSL manager for XV0SU, XV100HCM and 3W100HCM.

Steve AA6L/KH5 was worked on 3 August. He was operating from Home Island in the Palmyra Island Group. QSL to his home call, only in the 1990 callbook.

YB45RI was a special call celebrating Indonesian Independence Day.

The QSL cards for the 3D2AM Conway Reef Expedition are not out yet. YASME is waiting for the cards from the printer.

4K2PGO from Franz Joseph Land was active on the 14225 5 Family Hour Net. QSL to: RA9LA.

JAT7BSX was busy as a net controller on 14182 at 1100 UTC for XU8DX which is a club station in Cambodia. For contacts made after 19 April QSLs go to JA1NUT to his new correct address 200-9, Naka, Mookha, Tochigi, Japan. SASE please according to the ARRL DXCC. This operation is not valid yet for the DXCC, due lack of documentation.

The Grosse — Ile expedition C10GI, in its 72 hours operation made 3650 contacts on SSB and 3800 contacts on CW. The DXCC will

vote in September for a recommendation whether it will recognize the operation as a separate DXCC country or not.

ZD8Z is active from Ascension Island for the next two months or so. QSL to W6CF.

Malawi is also active in the CW mode. The operator is Rudi DK7PE, and QSL to his home address.

It is rumoured that F2FYD will be active from Sudan as ST0YD and as ST2YD for the next nine months.

The Nicaraguan call areas have been changed, so do not be surprised if you hear "new" stations. YN1CC, Jose, had many contacts previously as YN3CC.

9H1XX will be the call sign used by DL2GBT for his 23 September to 21 October activity from Malta on 10 and 20 metres. QSL to home call via the Bureau.

John Rouse KA3DBN will operate as VP2EBN from Anguilla (NA-22) on CW, SSB and RTTY from 1 to 8 October. QSL direct to home call via SASE.

V31BB is a silent key due to an accident when he was operating. Logs are now with N3ADC.

Koeko Yamakami, Box 3, Toikamura, Zip

31911, Japan, was active as ZK1XY from Suwarow Atoll (OC-80) in the North Cook Islands.

If you worked S79NBD and S79DBI between 12 and 18 September, send your QSL cards to JG1NBD and JLIARF, respectively.

The shortlisted Trindade DXpedition ZY0TK and ZY0TW was on the island for only two days; a longer stay was refused by the naval authorities. They made only 2816 QSOs, mostly with North American and European stations due to poor propagation. They had only nine SSB QSOs on 14 MHz, two on 28 MHz, and one CW QSO; a total of 12 with Oceania. Any VK worked them?

Interesting QSLs Received

Note: W=weeks; MO=months; FM=from; MGR=manager; OP=operator

Y93VL (7MO FM Bureau), ZM1WTD (6MO FM Bureau), SV5TS (5W FM OP), HK1KHK (4W FM OP), T6RR (72 FM OP), VK0JR (6W FM MGR), OA4ED (3W FM OP), TQ7JM (3W FM MGR), VK9EW (2MO FM OP), S21U (3MO FM MGR), TZ6VV (6MO FM MGR), 5H3TW (2W FM MGR), KG4UN (2MO FM

OP), 3W3RR (4MO FM OP), PJ2HB (5W FM MGR), 5B4SA (8W FM OP), 7X2AK/3 (16 MO FM OP), HR1RMG (4W FM OP), 9L1US (10W FM MGR), FT4XG (3MO FM MGR), 9K2YA (12W FM MGR), ZS8MI (4W FM MGR), HR2FD (8W FM OP), FT5XA (12W FM MGR), 190XV (3W FM MGR), HJ1MPK and HJ6QKZ direct, unsolicited.

Thanks To You

To all the supporters of this column, many thanks. For the letters, reports, photographs special thanks to the following:

VK2SG, VK2RQ, VK2FNJ, VK2DID, VK2EKY, VK3DD, VK3TU, VK4OH, VK4MWZ, VK4DA, VK6WO, VK9NS, H44AP, WA4JQS, OESEEG, HA5HR, "QRZ DX" and the "DX Bulletin".

And, if you want the DX to chase you, instead of the other way around, take part in the 1990 VK-ZL-Oceania Contest. SSB section on 6 and 7 October, and the CW section on 13 and 14 October. See September 'AR' for the slightly changed rules.

Good DX and 73. ar

WARC-92 UPDATE

DAVID WARDLAW VK3ADW
WIA WARC-92 TEAM LEADER

While the agenda for the 1992 World Administrative Radio Conference (WARC-92) has been established, the full extent of possible threats to amateur allocations will not be known for some time.

Countries' proposals in response to the agenda are due eight months before the conference convenes on 3 February 1992. Over the weekend of 7 July, the Administrative Council of the International Amateur Radio Union met in Boston to review the WARC-92 agenda and to assess its possible impact on amateur radio.

The greatest threat is to the 7MHz band, from possible expansion of the exclusive allocations for HF broadcasting. Other bands facing significant potential threats include the 3.5, 10.1 and 14MHz bands, from the same source, and the 144 and 420MHz bands from low-orbit mobile service satellites, whose proponents are looking for spectrum to share with existing services. While no reallocation decision to accommodate wind profiler radars is to be made at WARC-92, discussions will take place that may eventually affect the 420MHz band and possibly others.

New space applications above 20 GHz may affect present allocations there. Pressure on the microwave bands below 3 GHz will be intense as a result of new and expanded services being considered in this range: satellite sound broadcasting (along with a complementary terrestrial broadcasting service),

future public land mobile telecommunications systems, an aeronautical public correspondence service and mobile satellite services.

And finally, high definition television broadcasting by satellite will create pressure on the microwave frequencies above 10 GHz.

The Australian preparation for WARC-92 continues to be twofold.

Firstly, through the Australian National Study Groups of the CCIR, which are concentrating on the various IWPs that are preparing input for JIWP WARC-92 which will prepare the CCIR report to WARC-92 which will be the technical basis of WARC-92.

Secondly, through the committees of the APG for WARC-92 which are now concentrating on the agenda for WARC-92.

The WIA is representing the amateur service at both of these levels.

The WIA has presented papers on the frequency requirements, operating and technical characteristics of the amateur service.

They describe the importance of the various bands to the amateur and amateur-satellite service and will assist in the discussion of the possible effect that any proposed changes to the existing frequency table will have on the amateur and amateur-satellite service. It is hoped this will help prevent a disadvantageous situation for the amateur amateur-satellite service arising.

IWP = Interim Working Party; JIWP = Joint Interim Working Party; APG = Australian Preparatory Group — Ed. ar

WIA SLOW MORSE TRANSMISSIONS

VK2BWI	Nightly at 0930 UTC on 3550 kHz
VK2RCW	Continuous on 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3RCW	Continuous on 144.950 MHz 5 wpm, 10 wpm
VK4WII	Tuesday at 0930 UTC on 3535 kHz
VK4WIS	Nightly at 0900 UTC on 3542 kHz
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 1030 UTC on 3550 kHz
VK6RAP	Nightly at 2000 local on 146.700 MHz
VK6WIA	Nightly (except Saturday) at 1200 UTC on 3.555 MHz

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

By now, those Morsiacs who thought they could play with batteries without spilling acid everywhere should have some new holes in their trousers. I warned you... so, mums and KYLA, don't blame me! But a good battery is worth a pair of pants, in my book, anyway.

The fish are biting this month, because of my recent proposal for a new Morse-only licence, currently on packet radio bulletin boards and in many club newsletters, and the angry opponents are biting hardest. The simplest way for you to find out about the proposal is to contact your nearest packet expert and ask for a print-out. You can send me a SASE and I will run you off a copy, together with the quick answer form for your opinions. Believe me, there are many opponents who seem to hate CW and cloud the issue with their own ideas, which they are not really prepared to back up with the work involved in putting forward their own proposals. I guess this is to be expected on packet, and I would like to find out exactly how many amateurs use each mode. When and if I get enough support, I will submit details and statistics to the Institute for a serious application to DoTC.

Although a slanging match appears to have started on packet, I don't want to see the same thing in print, you know how it goes with "letters to the editor" etc.

We Morsiacs know about the operating skills and enthusiasm that use of CW engenders. We are the only members of the amateur fraternity who can be expected to communicate the advantages to prospective amateurs, and not, as many think, try to convert established amateurs who are not interested. Think about it. We are up against such things as the New Zealand Branch 74 Discussion Paper, so it won't be easy.

Peter Alexander VK2PA gives his answer to the discussion (below) BUT it is from a defensive position. An aggressive campaign to encourage CW and gain new amateurs is needed, and I'm just the sucker to provide it! But, enough from me, read Peter's case, he is a respected amateur, home-brewer etc, and was winning contests in 1946 or thereabouts. I've got the Radio & Hobbies magazine here to prove it! (Before I was born hi).

"The CW Saga: A Case for the Retention of Morse Code, by Peter Alexander VK2PA (Westlakes ARC Newsletter, June 1990).

This reply is to New Zealand Branch 74 Discussion Paper 72/90 which proposes to do away with Morse Code by the minority "CB mentality" group. Well, with WARC 1992

coming up, there is going to be a lobby to get rid of Morse code for sure. If they win this time, in a generation it will all be over. So here we go, point by point from the ZL discussion paper.

Morse code over the years has proved a very effective mode of communication and, in most cases, is far superior to any other mode given the same difficult conditions that more often than not exist. Reliability per Watt of power is more effective than any other mode.

Ongoing Decline of Morse Code?

Don't be mesmerised by this heading. I would like to know where are the facts for this statement. Observations made over the years, and in particular over the past 12 months, show an increase in the use of Morse code as a means of communication. During the present sunspot cycle, a count of the various modes on the HF bands shows that Morse code is the preferred mode (60 per cent) especially amongst DX stations. Westlakes Radio Club produced a CW kit for its members, selling for \$10, which became very popular. The polls taken in Australia favour the retention of Morse code and that it be an examination necessity.

No Objectivity in IR Regulations?

There is every assurance that demonstrating the ability to send and receive Morse code will make the candidate a better radio amateur. It demonstrates a skill and, with practice, becomes a second international language with no accent and allows one to communicate directly with any amateur in the world no matter what his/her native tongue. The dividing point should be 30 MHz as there will be a lot of Morse code below this frequency for years to come, and an amateur should have the ability to know "what is going on".

There is no skill required to be a communicator on SSB, or in the use of a black box, and certainly no skill is needed to operate packet radio; you don't even have to be able to type. One would suggest that it would be no harder to learn to type than to learn Morse code, so to provide effective communications on packet radio and RTTY the operator should have at least a 50wpm typing ability. Perhaps a typing test for digital operators should be included in any examination in future and made an international requirement. In this regard I would agree that the international regulations have been out of date for some years, but certainly not regarding Morse code requirements.

Survival on Merit for any Mode?

Perhaps this heading should read "Survival of Amateur Radio"? If anything is going to destroy amateur radio, it is going to be caused by lowering the standards that have been in place as basic requirements. Modes that require skill are necessary, as is the knowledge on the technical side. Morse code provides the training ground for good operating practices on HF bands that wash off on other modes of communication. Novices, once technically qualified, are either novice/limited licensees, or full call amateurs if they have qualified from 5 wpm to 10 wpm in Australia, so the extra privileges are automatic.

Impact of Commercial Equipment?

Yes, the black box syndrome, and isn't it a shame the number of so-called amateurs don't know what is going on behind the knobs, let alone adjust the transmitter correctly. And the splatter from the big linears! Agreed that commercial equipment has become the way out, but in spite of this, "do it yourself" kits are still available in many countries, and popular, so there is still a demand. The builders of home-brew gear are all the better for it.

The cost of commercial equipment is a far greater deterrent than passing a standard examination including Morse code. India, for instance, and many third-world countries, have this problem. The government of India has supported amateur radio with grants to construct home-made equipment from the ground up. The most used mode on HF is not SSB, but Morse code, certainly not packet or RTTY. The reason is obvious.

Vocational Aspects?

The basic knowledge gained from an amateur examination is hardly fitting for a position in the electronics industry. It has been made too easy with black boxes and the demise of the written technical examination, which was a step backwards. What is the basis that Morse code has little commercial significance? Hundreds of commercial stations can be heard on HF still using Morse code, and the fact that digital modes and FAX have been used in amateur and commercial for years is nothing new. SSB has been used since the radio-telephone circuit was introduced between London and New York in 1927. There was not much amateur SSB until the '60s, and there was even a New Zealand firm selling a phasing rig kit in the late '50s. How many of today's amateurs could build an SSB transmitter?

Need for Lobbying?

The push to have Morse code removed as an exam requirement comes from people who:

- want extra HF privileges but do not want to work for them;
- would like to become radio amateurs but

are not prepared to make the effort to learn code,

c) amateurs who lack the skill. The funny noises would no longer annoy them.

I have spoken with many amateurs, particularly novices, who have become or are becoming very skilled. They have made the effort. No way do they want Morse code removed from exams. The ease of learning the code is indicated by the area from Turec to Coffa Harbour, 150 miles of coastline. There are 238 amateurs and only eight are limited licensees. It is a known fact that Morse code is being phased out in the commercial world, although not entirely. It is for a basic economic reason, but we are amateurs; not in the business of trying to provide a commercial service. It should be that we carry on the basic traditions of amateur radio and maintain the capability of Morse code. Consider the advantages: it is the most reliable mode; it requires less power for the same distance covered; it has no language barrier; it takes less band space than any other mode; it can be used

with a transceiver costing \$75 or less.

It is significant to note that Morse code is still being taught in the armed services, and is also a requirement for commercial and private aviation.

The International Radio Regulations state: "Any person operating the apparatus of an amateur station shall have proved that he is capable to send by hand and receive correctly by ear texts in Morse code signals. Administrations may, however, waive this requirement in the case of stations above 144 MHz". (In Australia the Morse requirement is waived above 50 MHz).

Suggestions of a Morse code test with a 2wpm sending and receive capability and a 50 per cent error rate are ridiculous. This would not even be a pass in the Boy Scouts! The problem is not the international regulations. The people who want to be big boys are not prepared to do the work. They make the most noise and the least effort, or perhaps they are satisfied with the standard they have reached.

STAY ON COURSE, SAY YES MORSE!

73 PETER VK2PA

Peter makes plenty of valid comments, and I agree with some of them. But "letters" never seem to achieve anything concrete. The people who have made up their minds and started the discussion about dropping Morse code are not going to listen to arguments. They are simply going to lobby their cause as effectively as they can.

What I think we can do is provide, through our CW clubs etc, positive ideas to make radio attractive, ways that do not threaten any established spectrum users, so they are less inclined to oppose us. We can even turn their opposition around by showing them how they can use our methods to achieve their own aims, but we will all have to work at it in a positive manner. Let us agree with everything our opponents say, that Morse is obsolete, difficult, etc etc, and then ask them to help us make it easy to at least try it if somebody wants to.

73 FOR ANOTHER MONTH.

GIL AR

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
9 WEST TERRACE MENINGIE 5264

All times are UTC

Beacons on Six Metres

Freq	Callign	Location	Grid square
50.000	GB3BUX	England	IO73
50.005	H44HIR	Honihara	Q100
50.005	HL9TG	Korea	
50.005	ZS2SIX	South Africa	KP25
50.011	JA2IGY	Japan	PM84
50.015	SZ2DH	Greece	KM18
50.017	JA6YBR	Japan	PM81
50.020	GB8SIX	England	IO73
50.020	CX1CCC	Uruguay	
50.025	6Y5RC	Jamaica	FK17
50.025	OH1VR	Finland	KP12
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN81
50.032	ZD8VHF	Ascension Is	II22
50.032	ZS5SIX	South Africa	KG50
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JC87
50.039	F77THF	French Guyana	GJ35
50.045	OK3VHF	Greenland	GP60
50.048	CT4BFK	Guatemala	
50.050	GB3NHQ	England	IO91
50.050	ZS6DN	South Africa	KG44
50.056	VK9VF	Darwin	PH67
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GG66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB30/1	Rhode Island	FN41
50.066	VK6RPH	Perth	OF78
50.063	KH6HI	Hawaii	BL01
50.075	V56SIX	Hong Kong	OL72
50.078	T12NA	Costa Rica	EK70

50.080	KH6JJK	Hawaii	BL11
50.080	KH8SIX	Galapagos Is	E159
50.085	9H1SIX	Malta	JM75
50.086	VP2MO	Montserrat	FK96
50.088	VE1SIX	Canada	FN65
50.090	KJ6BZ	Johnston Is	AK56
50.092	W5GTP	Louisiana	USAEM40
50.099	KP4EKG	Puerto Rico	FK68
50.100	HC2FG	Ecuador	FI07
50.100	5H1HK	Tanzania	
50.110	KG6DX	Guam	QK23
50.110	A61XL	United Arab Emirates	LL74
50.120	5S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	KG50
50.490	QJ1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
52.100	ZK2SIX	Niue	AH50
52.200	VK6VF	Darwin	PH57
52.310	ZL3MHF	Christchurch	RE66
52.320	VK6RTT	Wickham	QG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QP26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK3RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofy	PF96
52.460	VK6RPH	Perth	OF78
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK6RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Climie	RE78

Having recently returned from hospital to continue the recovery process, I found that my computer had decided to no longer work, so temporary measures have been undertaken to use another which, fortunately, is compatible (after adjustments) with my discs to allow the retrieval of already stored information.

A vast amount of new information has arrived regarding the Six Metre Standings, and this has to be added to the already stored computer information. If I am unable to finish this by my printing deadline, then it will be held over to the next issue.

Six Metres

From the few reports received during my absence, the six-metre band has been very quiet, even at the VK5BC Establishment. John VK4ZJB reports from the Brisbane area that the only long distance signals appear to be a few openings to Japan. However, it seems that the solar count is rising (and falling) so, by the time you read this, some further good DX contacts may have ensued. I feel certain we have at least another two years during which we can expect to make some very rewarding contacts, especially during the equinoctial periods. It will be a case of being vigilant and prepared to get out of bed around 2120 for some of the best contacts, which often occur between then and 0000.

From the USA

Bill Tynan W3XO/5, in his QST column "The World Above 50 MHz", reports that despite often repeated comments that F2 conditions appear to be deteriorating, many were reporting good results. Bill said he had added eight new countries since early March

LU3EX reported nine additions, bringing Alfredo's total to 105! Doug ZP6XDW in Paraguay, South America, made 283 contacts in 39 countries from February to April.

Some results of Joel's N6AMG Pacific DXpeditions were that as VK9LG at Lord Howe Island he had 820 contacts in 19 countries, including 97 VKs. From American Samoa as N6AMG/KH8, he made 450 contacts in 11 countries, including 106 VKs. His best contact from there was to ZC4MK on long path over southern South America. From Western Samoa as 5W1JP, Joel made 550 contacts in 24 countries, including 63 VKs and notable contacts to 5H1, CEO, ZP, XX9 and HH, with the band open up to 20 hours a day! His station consisted of an IC-575H to a 1kW solid-state amplifier using MFR-154s and a two-wavelength Yagi modified so that it could go as carry-on baggage.

The W3XO/5 report in August QST covers the massive Es openings they enjoyed on six and two metres for about a week at the end of May. On 26/5 T2HLL, CO2KK and CO2CB were available. On 27/5 W4s worked VK3OT and VK3AMZ and some ZLs. On 29/5 W1JA/4, using 10 Watts, worked VK4BRG. On two metres, WA3HMK worked CO2KK in Cuba, though they had been trying for some time to now in order to accomplish a contact via meteor scatter.

Via Japan

Courtesy Graham VK6RO, the Japanese "ham radio" magazine for July 1990 advises (from PA3EUI and PA3249) of six-metre operations now allowed from the following European countries: HB from 0400 to 0600 1/290 to 31/12/90 on 50 000 to 52 000 with an ERP of 100 Watts; LX 0000 to 2400 from 1/3/90 50 100 to 50 200 and 100 Watts; OE 0000 to 2400 1/290 to 31/1/91 50 000 to 52 000 and 25 Watts; ON 0000 to 2400 1/1/90 to 31/12/93 50 000 to 50 450 and 30 Watts; OY 0000 to 2400 from 1/1/90 50 000 to 51 000 and 500 Watts input, OZ 0000 to 2400 1/1/90 to 31/12/90 50 000 to 52 000 and 500 Watts input. Quite interesting!

The DX Window

From the SMIRK journal, the Six Shooter, comes the following: "SMIRK and other national organisations around the world have worked long and hard to develop the DX Window concept. It now has met with international approval. There is an agreement in effect that ALL NATIONAL QSOing will be kept out of 50 100 to 50 125. Only DX are to be worked there... if you make a non-DX contact in the window, move them out of it immediately. Ask those who are in the window in error to make out. Why risk screwing up someone's once-in-a-lifetime DX contact."

As always from SMIRK, the statement is very much to the point, but the text of the message has certainly been expressed on a

number of occasions here in Australia and through these columns. One can only hope general support will come from Australian amateurs for such sensible operating.

Other Items

HB011s licensed

I hope you did not miss the item on page 8 of August 1990 AR of the new South Australian 10 GHz record created on 7/5/90 between Des VK5ZO and Nick VK5NT over a distance of 147.1 km. And this coming on top of their new national record on 5.7 GHz last November. Congratulations!

1296 MHz

Following the acceptance of the job of looking after the WIA VK5 Equipment Supplies material, David VK5KK and Mark VK5AVQ have done much to revitalise the section. David, in particular, has spent time and energy in the preparation of transverter kits for use on 1296 MHz. At last count, more than a dozen had been sold and it was difficult to keep up with demand. If all those who have made purchases now go ahead and bring the equipment to an operational stage, it seems 1296 MHz will be a busy band and perhaps rival that of the VK3 potential for activity.

Closure

As I am slowly beginning to take up the cudgels again, there has been not a lot to report this month. I hope that at least some of my fairly regular correspondents will now start writing again so we may learn of happenings in other places.

Two thoughts for the month: "Drowning problems in an ocean of information is not the same as solving them," and "Nobody is wholly tolerant. The more you believe in tolerance, the less you can tolerate the intolerant."

73 FROM THE VOICE BY THE LAKE

Late News

England

Ken Ellis G5KW advises that at the age of 82 he is still very active on amateur radio. He was recently appointed editor of the VHF/UHF column of Ham Radio Today. He has asked me to swap information with him, which I will do.

Ken advises that quite a number of stations in the British Isles have now worked around 90 countries on six metres, with Geoff Brown GJ4ICD heading the list with 96 worked and 88 confirmed. Ken has worked around 80 countries. This again confirms that there are decided advantages in living in the northern hemisphere where there are so many countries at distances which can be worked on six metres.

West German stations are now allowed 25 Watts ERP on CW and SSB, and about 300 stations have applied for the permits, which are being issued for 12 months operation.

Although of little value for operational purposes, the activation in recent times of the following areas on six metres is of value for record purposes. FE1JKK/FY French Guiana is on six metres, and his QSL manager is FD1JMH. On 2/5 CT1DTQ worked RB5LE/87 on CW. June through August DXpeditions were OH0BT from Aland Island, OH0M from Market Reef, JW5QFA, JW1MFA, JW9VDA and JW9ZV from Svalbard, activated by three PA stations. QSL via Box 3506, GL Utrecht, Netherlands; G3SDL activated the Geneva Club station 4U5ITU; from Leichtenstein HB0/HB9QQ. QSL via HB9QQ.

Brunei

Andrew Davis V85DA writes to say there has been limited six-metre activity since December 1989, when he heard JAs working W6, W7 and KL7. On 24/12 he worked KL7BB. Next contact was 20/1 to KJ6W/DUS; 9/2 JAs on CW, 16/2 VK8s and VS8s; 21/2 JA and YB; 22/2 VQ9LW, who is one of several operators using one Swan 250 which has no RIT, no dual VFO, no split capability, so it becomes difficult to use during a JA pile-up! 28/2 JAs; 9/3 JAs; 10/3 KG6DX, a very difficult contact due to the placement of the equator; 11/8 VK8ZLX and VK8TM; 13/3 and 25/3 JAs; 31/3 JAs and 5H1HK and later VS8B1 and P29PL. The above list shows not all places on this earth which may be loosely termed exotic are necessarily blessed with good six-metre signals with many countries from which to choose!

Andrew has now been joined by Brian V85EB, formerly VK2EEB, who has an FT860 and a power amplifier he is to build and will be active on six.

Andrew has worked all JA prefectures and almost 200 JA cities, to which he wants to add, as he is not sure how much longer he may be in Brunei.

Thanks for writing Andrew.

50-54MHz DX Standings

DXCC countries based on information received up to 15 August 1990. Crossband totals are those not duplicated by six-metre two-way contacts.

Column 1 50/52 MHz two-way confirmed contacts
Column 2: 50/52 MHz two-way worked
Column 3: Crossband 50/52 MHz to 28 MHz confirmed
Column 4: Crossband 50/52 MHz to 28 MHz worked
Column 5: Countries heard on 50/52 MHz

Callign	1	2	3	4	5
VK3OT	63	69	2		6
VK4ZJB	63	68		4	
VK2QF	58	60			
VK2BA	55	58			
VK4ZSH	53	61			
VK8ZLX	44	52			
VK4ALM	42	48			
VK8GB	42	42			13

Call sign	1	2	3	4	5
VK4ZAL	37	49			
VK3AMK	34	42			
VK3AWY	34	36			
VK5RO	32	46			
VK3NM	31	34			
VK5LP	30	31		9	
VK3AUI	27	28			
VK2DDG	25	26	2	15	
VK4KHZ	23	34			
VK6HK	23	32	1	3	
VK3XQ	23	25		2	
VK4TL	22	23			
VK2KAY	21	23			
VK2BNN	20	21			
VK9LG	20	20			
VK4BJE	19	25			
VK6RO	19	23	3	13	
VK7JG	18	20		2	
VK3TU	17	19			
VK9XT	17	17		4	
VK2ZRU	16	19		4	
VK9LE	14	14			

Call sign	1	2	3	4	5
VK9YT	12	14			
VK6OX	10	10	1	1	
VK9ZLX	9	9			

Overseas

JAZTTO	48	48		6	
YJBRG	25	25			

After many production problems, mainly due to absence from home, the August 1990 Six Metres Standings List has finally appeared. If there are any errors, please let me know.

Because there were too many hassles to safely designate who could work where and when, the present list contains all contacts made. I cannot safely state when Channel 0 was on, nor can I vet those contacts limited to 25 Watts; others were told to go on operating but not to cause interference.

In my present state of health recovery I

cannot find the energy to sit down and adequately fight what some might see as an issue. At this stage I believe it is very important to know the extent of the various worldwide contacts, and when I finally write the history of Cycle 22, then a large amount of information is readily available to me.

The next list should appear in February 1991, so information would be appreciated by 20 December 1990, please.

One would have to say "well done" to those who have turned in very high scores, most of whom live well up the country from Sydney, through to Brisbane and beyond. However, Steve VK3OT has worked hard for his top placing and has spent many hours calling on CW and listening for the occasional rewarding reply. I know he has been there because I can always hear him at Meningie, either on forward or back scatter or direct.

Finally, thank you to so many operators who have enquired after my health — your concern has meant a lot to me and will be remembered.

BT

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074

Thanks to Graham VK5AGR for stepping in at a moment's notice and keeping this column going when I was unexpectedly put out of action for a while.

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI

Information Nets

AMSAT Australia

Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz
(7.064 MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for \$20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of \$10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

PACSAT Protocol Release Soon

(From AMSAT News Service Bulletin 230.01, 18 August 1990)

PACSAT Protocol Spec to be Released at ARRL Computer Networking Conference

Next month at the Ninth Annual ARRL Computer Networking Conference to be held in New London, Ontario, software developers will have an opportunity to examine the PACSAT File Transfer protocol specifications document. This document will have a profound effect on all PACSAT users because it will state in very precise language the rules that terminal communication programs will have to implement in order for hams to use the BBS capability of the PACSATs. This is in stark contrast to FO-20 which works with any of the popular communications programs. For example, using a regular computer terminal

program an FO-20 user can, using a station equipped with a PSK modem, TNC-2 and appropriate VHF/UHF antennas and transceivers, access the FO-20 BBS mailbox and download files or read mail etc. This can all be done without a special communications program. In other words, the same program that "talks" to a TNC-2 or telephone modem will do just fine for FO-20. For the PACSATs, it will be necessary for the user to have a specially written program for the specific computer which will be used in the PACSAT station. It must be a special program which follows all the rules specified in the PACSAT File Transfer Protocol document authored by NK6K, GO/K8KA and N4HY. The basic reason for using this new PACSAT File Transfer Protocol is to allow for more efficient file transfers, according to NK6K. He points out that using the UO-14 test bed, he was able to upload a 30kbyte file in less than a minute at 9600 baud. At 1200 baud, this will take about eight times longer. Without this more efficient file transfer protocol, it could take several passes to accomplish the same transfer. Hams familiar with the packet radio protocol AX.25 will immediately recognise that this PACSAT File Transfer Protocol is just another "layer" to AX.25. Although users may initially find this a burdensome requirement, it is AMSAT's intention to release this File Transfer Protocol far in advance of BBS operations on the PACSATs so that software developers can start to work immediately on terminal programs for the various computers found today in PACSAT stations. Also, there will be "shareware" programs which will provide examples for software developers. Stay tuned to AMSAT News Service (ANS) bulletins for further information about the availability of PACSAT terminal programs.

UoSAT-F News

(From Spacenews, 13 August 1990)

While efforts continue to get UoSAT-E (OSCAR-15) operational, the University of Surrey (England) is already designing a new spacecraft, UoSAT-F, which should be completed in time for a lift into orbit by an Ariane rocket on an ESA launch. UoSAT-F is expected to carry a Mode-A transponder (2m up, 10m down) along with other experiments.

Microsat Polarisation Studies

(From AMSAT News Service Bulletin
237.05, 26 August 1990)

AO-16 command station WD0E is studying the downlink polarisation sense, or 'handedness' of the signals from all the Microcasts. In order to obtain as complete a picture as possible he is interested in receiving your observations. If you are receiving the Microcasts with a circularly polarised antenna whose sense can be switched, Jim requests that you send him the following data: Microcast number, observed polarisation sense throughout, a high elevation pass over your station, and date and time of the observation. The sense of the downlink signal (left or right handed) can be found by switching your antenna between the two and noting which results in the stronger signal. Jim asks that you also include an observation of AO13 near apogee with the same antenna.

Results will be published in the AMSAT-NA Journal. Send your observations to Jim White, WD0E • WGLJF, or via Compuserve 71477.546.

OSCAR-10 News

AMSAT-OSCAR-10 appears **NOT** to have been receiving sufficient polar panel illumination to support Mode-B transponder operations. Both beacon and transponder signals started showing signs of FMing. Therefore, until further notice, please **DO NOT** use AO-10's transponder.

It is expected that AO-10 may once again receive sufficient solar illumination to support Mode-B transponder operation by November.

SAREX/Astro Mission News

(From SAREX Bulletin SAREX-238.04 from the SAREX team, 26 August)

The STS-35 Astro Mission
(Note: This mission was rescheduled for a 1 September launch which, at the time of writing, had been set back to 5 September — Maurice VK5EA)

Although amateurs may view the Ron Parise (WA4SIR) on STS-35 in the Shuttle Columbia as the ultimate DXpedition, the real purpose of the mission is the flight of the Astro-1 astronomical research observatory.

The Astro -1 Observatory will function during the entire 9-10-day mission. Astro-1 is

NASA 2-line Keplerian Elements - 31 August 90

AO-10			Epoch--	Drag--					
1 14129U	83	58	B 90238.61338051	-0.00000014	0.0000-0	0.0000000	0	5461	
2 1412Z	26.0406	187.8160	5953791	170.7905	208.8811	2.05880617	54156		
UD-11									
8 14121U	84	21	B 90234.56891156	-0.0001231	0.0000-0	2.3517-3	0	7681	
2 14781	97.9463	284.9634	0013376	41.3670	318.8391	14.6657187634	5690		
MIR									
1 16609U	86	17	A 90242.25898469	-0.000001934	0.0000-0	1.0983-3	0	898	
1 6609	51.6122	318.4066	0025994	309.3050	50.4886	15.61310960259680			
1 16129U	87	54	B 90238.82861413	-0.00001244	0.0000-0	1.2506-3	0	3011	
2 1812Z	82.9234	276.3374	0010324	285.3382	74.6828	13.72104781159130			
AO-13									
8 16151U	88	51	B 90233.10507929	-0.00000146	0.0000-0	9.9999-4	0	1444	
2 1921E	66.9230	139.8507	7012370	234.0055	39.5261	2.0985679	16733		
UD-14									
1 20437U	90	5	B 90241.71324784	-0.00000735	0.0000-0	3.0786-3	0	2021	
2 2043Z	98.6918	317.5947	0010966	303.847	85.1656	14.28869501	31365		
1 20438U	90	5	C 90239.08839472	-0.00000337	0.0000-0	1.6074-3	0	1158	
2 2043Z	98.6992	314.9507	0009756	311.1806	48.8550	14.28414913	30984		
AO-16									
8 20439U	90	5	D 90237.63603804	-0.00000506	0.0000-0	2.1867-3	0	1034	
2 2043Z	98.7008	313.6744	0011129	316.7523	43.2786	14.26790692	30787		
UD-17									
1 20440U	90	5	E 90234.47862021	-0.00000343	0.0000-0	1.6215-3	0	1104	
2 2044Z	98.7011	310.5391	0011466	326.8827	33.1840	14.28833961	30333		
1 20441U	90	5	F 90234.67340584	-0.00000335	0.0000-0	1.4868-3	0	1050	
2 20441	96.7007	310.7603	0012011	326.5190	33.5234	14.28927213	30366		
LO-19									
1 20442U	90	5	G 90240.47474793	-0.00000559	0.0000-0	2.39894-3	0	1095	
2 2044Z	96.7016	316.5720	0012051	308.5742	51.4364	14.29006741	3190		
FO-20									
1 20480U	90	13	B 90226.64199642	-0.00000003	0.0000-0	0.0000-0	0	1018	
2 2048Z	99.0385	262.1079	0540315	276.1807	17.8024	12.63315848	24240		
MIR-21									
1 20508U	90	37	B 90235.99934326	-0.00000115	0.0000-0	0.0000-0	0	1870	
2 2058Z	26.4713	178.0831	0005875	117.1031	243.0465	14.84797747	18065		
BADR-1									
1 20895U	90	59	A 90235.52089451	-0.0018880	0.0000-0	0.0000-0	0	497	
2 20895Z	27.4933	163.0815	0495002	174.2523	154.2844	15.07540744	5787		
	inclIn	RAAN	eccIn	ArgPArp	MeanAnOrb	MeanTimeOrb	Orb.		

NOTE: NASA has now correctly reverted to using Catalogue Number 20480 for Fuji-Oscar-20 in its 2-line format Keplerian Elements. (For the last 3 months the number 20479 has been used.)

OSCAR-13 Schedule for 1 Oct to 5 Nov 1990

Station: Adelaide

Hour = UTC

[illegible]

AD-13 Schedule 17Oct90 to 26Dec90

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Node-B : NA 006 to NA 095
Node-J1 : NA 095 to NA 125
Node-L5 : NA 125 to NA 130
Node-S : NA 130 to NA 135
Node-BS : NA 135 to NA 140
Node-B : NA 140 to NA 256
Omni-s : NA 220 to NA 040
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carrying four instruments.

- the Ultraviolet Imaging Telescope (UIT) from NASA Goddard which will take the best-ever ultraviolet photographs of faint stars and galaxies,
- the Hopkins Ultraviolet Telescope (HUT) from Johns Hopkins Uni, which can make spectral measurements in far ultraviolet;
- the Wisconsin Ultraviolet Photo-Polarimeter Experiment (WUPPE) developed at the Uni of Wisconsin which will study the polarisation and brightness properties of interstellar dust.
- the Broad-Band X-Ray Telescope (BBXRT) from NASA Goddard which will study the X-ray spectra of strange objects observed by earlier satellites.

The UIT, HUT and WUPPE instruments share a common telescope mount, so their observations will be collected in the same regions of the sky. BBXRT operates independently of the other three experiments.

The seven-man crew of STS-35 is:

Commander: Vance Brand

Pilot: Guy Gardner

Mission Specialists: Jeff Hoffman, Mike Louns and Bob Parker

Payload Specialists: Ron Parise and Sam Durrance

WEBERWARE 1.0 Operating Hint

(From AMSAT News Service Bulletin 244.05, 1 September 1990)

WEBERWARE 1.0 Picture Processing S/W Operating Hint

Chris Williams WA3PSD of Weber State University (WSU) has provided the following operating hint to the AMSAT News Service (ANS) concerning the use of WEBERWARE-OSCAR-18 (WO-18) picture processing software, WEBERWARE 1.0.

WW1 0 expects captured data files to begin with complete packets, not in the middle of a packet. Specifically, the file must begin with the packet delimiter CO hex and appropriate packet header bytes. To ensure that this is the case, file capture (or "dump" in TLMDCC) must be active before any packets are received from the TNC during a pass.

WA3PSD points out that it is standard

SATELLITE ACTIVITY FOR MAY/JUNE 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Nation	Period min	App km	Prq km	Inc deg
1990-							
047A	RESURS-F6	May 29	USSR	88.7	260	190	82.3
048A	KRISTALL	May 31	USSR	89.9	346	220	51.6
049A	ROSAT	Jun 01	USA	96.1	588	567	52.9
050A	USA 59A	Jun 08	USA				
051A	INSAT 1D	Jun 12	USA	1140.0	35974	35767	0.2
052A	MOLNIYA 3-38	Jun 13	USSR	738.0	40839	492	62.8
053A	COSMOS 2038	Jun 19	USSR	88.7	262	192	82.6
054B	GORIZONT 20	Jun 20	USSR	1436.0	35877		1.4
055A	COSMOS 2084	Jun 21	USSR	98.2	746	590	62.8
056A	INTELSAT	Jun 12	USA				

3. Returns

During the period 35 objects decayed including the following satellites:

1983-027A	COSMOS 1450	May 30
1989-088A	COSMOS 2049	Jun 19
1990-041A	PROGRESS 42	May 27
1990-047A	RESURS-F	Jun 14

3. Notes

1990-048A KRISTALL docked with the space station MIR on 10 June. On board were a number of instruments and materials for scientific research.

1990-049A ROSAT carried Roentgen, a West German/US X-ray satellite.

1990-051A INSAT 1D is an Indian communications satellite.

1990-054A GORIZONT 20, a communications satellite, carried a MAYAK transmitter developed jointly by Bulgaria, Hungary, the GDR, the Soviet Union and the CSFR.

BOB ARNOLD, VK3ZBB

procedure at Weber State to begin capture (or dump) mode before passes start so WW1 0 does not have a feature allowing the input file to start with a partial packet.

Of course, to successfully capture the binary WEBERSAT (or other binary Microsat data), your TNC must be in KISS mode and the PC program must handle binary data correctly. Since most commercial PC terminal programs do not handle binary data correctly, even in binary modes (ie characters such as OO hex, FF hex, etc are not passed correctly or at all), most data gatherers are using TLMDCC, a program available from AMSAT, Compuserve and other AMSAT software sources.

To place a TNC-2 compatible TNC into KISS mode, it is necessary to issue the command, "KISS ON" and then to re-boot either with the "RESTART" command or by powering off and back on. This can be verified by the front panel lights. When KISS is started or when the TNC is powered up in KISS mode, the lights on the front flash three times. Otherwise, they flash once.

The recommended procedure is to:

- Verify that the TNC is in KISS mode.
- Run a program that will properly collect the binary data (such as TLMDCC).
- Begin capture (or dump) before the pass starts so that only complete packets are recorded in the file.

73s from MAURIE VK6EA

AR

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INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
'AVIEMORE' RUBYVALE 4702

Some disturbing news from Britain appeared in the 'Times' newspaper recently. Plans for increasing by 40 per cent the number of in-flight telephones in the 1-8MHz frequency. Much lobbying is expected until 1992 WARC

We should be aware of this in Australia also. European carriers are also planning an aero telephone service described as the last

"untapped market" for telecommunications. At the moment they are being denied freq spectrum (hooray). But, be warned — our carriers could have similar ideas, to get behind the WIA and our WARC reps with donations. This summer (UK) British Air will bring the trans-Atlantic in-flight telephone service — "Skyphone" — into commercial service. While this is satellite, a planned terres-

trial flight 'phone service based on CT2 technology is planned — each plane will be fitted with an aerial, PABX exchange, modem and transmitter/receiver to convey signals to the ground . . . no mention of frequency, but take heed, this warning must not be ignored by all amateurs.

Each month we see a new batch of coded messages. How do we deal with these fictitious(?) call signs(?) Take heart, we still have a lot of intruders we can help remove, given the number of observers and the information input we require to pass on to DoTC to give it a fair chance of success. **ar**

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CREB WEST LAUNCESTON 7250

I have been busily spending the past month monitoring on shortwave the current mid-eastern crisis over Kuwait. As I reported last month, Radio Kuwait continued to broadcast on HF after the Iraqis invaded that small Persian Gulf emirate. We now know there were several desert sites some distance from Kuwait City. Although the Iraqis had seized the studio complex, the Kuwaitis still had control of the HF transmitters for 28 hours after the invasion. They continued to broadcast defiantly with anti-Iraqi messages, calling on the population to resist the invaders, until it was silenced at 1112 UTC on Friday 2 August. It's not clear whether they destroyed it, or the invaders had captured the extensive facility. Indications so far are that the complex may have been destroyed, as the Iraqis have not utilised it for their propaganda output. They have continued to use Iraqi sites.

In the days following the invasion, the crisis deepened significantly. When the US, along with other nations, rapidly despatched troops to Saudi Arabia at the request of its monarch, the Iraqis retaliated swiftly by taking hostages from those countries which sent armed forces to the region.

The only way to transmit messages to those trapped foreigners in the region was via

shortwave. The major international stations rapidly scheduled extra transmissions to the Gulf area to cater for the demand. Even our own Radio Australia started targeting the Middle East with a special two-hour daily transmission. It is currently on from 1300 till 1500 UTC on 17630 and 21775 kHz. This is likely to continue now we have a naval presence in the region.

As many HF monitors are aware, the Iraqis have been extensively jamming several international broadcasters over the past 10 years, particularly during the Iran-Iraq War. Since the current crisis erupted, the notorious 'bubble' jammer can be easily heard on top of or under many Arabic language broadcasts. Nearby channels have also been affected by it. Those who have been targeted, especially the BBC and VOA, have swiftly added extra channels and extended the duration of their programming. Radio Netherlands and Radio Japan have added Arabic to their schedules, whilst others increased their mid-east output.

At press time, Radio Baghdad was being heard in English from 2000 till 2155 UTC on the single channel of 13660 kHz. I have heard reports of a transmission in English from 0130 to 0330 on 11755 kHz, but I cannot

personally confirm this.

The British Forces Broadcasting Service has been given transmission time over BBC sends three times daily to broadcast cheerios to British forces and trapped expatriates in the Gulf. They are currently broadcasting from 0200 till 0230 on 13745 and from 0930 to 1000 on 15205, 17695 and 21735 kHz (The last channel is, unfortunately, also used by United Arab Emirates Radio in Dubai and negates the BFBS signals). They also are on from 1330 till 1400 on 15195, 17695 and 21505 kHz.

There has been increasing speculation whether we could see the reintroduction of the United States Armed Forces Radio Service on shortwave, specifically to cater for the huge American forces within the region. They do have a satellite feeder from LA, which is downlinked to the Gulf. However, I expect that the SW service could be reintroduced, in the short term, as there are no AFRTS stations yet on line within Saudi Arabia.

The other major development is that Germany will now become one nation on the third of this month at 2300 UTC. The economic collapse of the German Democratic Republic hastened the reunification process before the first all-German elections on 3 December. No word yet on the future alterations of international broadcasting from a united Germany. It will probably not emerge until after the elections.

Well, that is all for October. Until next time, the best of 73 and good listening **ar**

FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

Murphy

In last month's issue, the call sign of the station worked by Moss VK7IK for a new VK7 six-metre record should have read W4EQM.

New Zealand News

New Zealand amateurs have lost the fight for 2300-2396 MHz, which has been divided

into twelve 8MHz wide TV channels for sale by tender. The move of ZL two-metre beacons to 144.250-144.300 MHz has not yet been implemented. On six metres, ZL amateurs may operate in the 50.0-51.3MHz range outside TV transmission hours, and may apply for certification to operate during TV hours. Repeater outputs and other transmitters will also be permitted on 53-54 MHz.

New Six-Metre Repeaters

The following channels have been reserved for proposed new six-metre repeaters. Sydney (Manly-Warringah) 550, Tamworth 576, Jervis Bay 575, Mackay 775.

Proposed Revised Band Plans for 2.3-10 GHz

The revised band plans are finally ready for comment and are included in this issue.

The present interim plans for these bands were derived from the Region 1 plans, and it is time to adopt new plans based directly on

actual operating practice in this country. The new plans also conform to international practice, with narrow band segments at multiples of 1152 MHz. However, IARU Regions I and II are proposing narrow band segments adjacent to the satellite bands, and these plans make provision to conform to those new sub-bands in the future.

The plans also include segments for narrow band simplex and duplex FM. FTAC does not recommend repeaters as such on these bands, however they are ideal for repeater links. Other modes are also catered for: there are segments for simplex and duplex data channels, which would also include high speed data forwarding links. A series of wideband "channels" is also provided, for modes such as FM ATV.

Planning for the 2.3GHz band is constrained by the need to avoid interference to MDS channels, which are located at 7MHz intervals from 2302 to 2400 MHz. The channels from 2344 MHz up are in current use and the plan allows only wideband modes above this frequency. The only exception to this rule is a "window" for the Region 1 EME band at 2390-2392 MHz, and provision for the possible new weak signal segment in the 2392-2400MHz region.

The 3.3GHz band is difficult to plan due to the possibility of interference to a number of other services, therefore the proposed plan contains a fair amount of open space.

On 5.7 and 10 GHz, there are few planning constraints and a wide variety of activities can be accommodated. The plans could take many forms, but the proposal presented here is very flexible. On both bands, narrow band segments are allotted on the current frequencies of 5760 and 10368 MHz. FM voice and data simplex segments are also provided, and there are also FM repeater link segments (separation is 80 MHz on 5.7 GHz and 150 MHz on 10 GHz).

Wideband operation is catered for on these bands with a series of 30MHz wide "channels". The four "channels" on 5.7 GHz are allotted two each to ATV and wideband data. On 10 GHz, there are eight "channels" for wideband FM, data or ATV. These "channels" can be paired up for duplex operation with 30, 60, 90, 120 or 150MHz separation, and even allow for four 60MHz wide channels at 10180, 10270, 10330 and 10420 MHz.

Some months of preparation has gone into these plans, and I would particularly like to thank Lyle Patison VK2ALU for making detailed comments and going to a great deal of trouble to collect information on overseas operating habits.

It is hoped to present these plans for adoption by Federal Council early next year, with any changes as a result of feedback from microwave operators. If you have any comments, please write.

Proposed Revised 13cm Band Plan

2300.000-2303.900
2303.900-2305.000
2303.900-2304.050
2304.050-2304.100
2304.050
2304.075
2304.100-1296.400
2304.100
2304.200
2304.400-2304.500
2304.500-2304.600
2304.600-2305.000

GENERAL USE, all modes

NARROW BAND MODES

DX only: EME

DX only: Terrestrial

CW calling frequency

RTTY (FSK) calling frequency

General Phone/CW

Calling frequency (primary national)

Calling frequency (secondary national)

Beacons: primary segment

Beacons: secondary segment

GENERAL USE, all modes

2305.000-2306.000
2306.000-2307.000
2307.000-2309.000

FM SIMPLEX — voice (25kHz channeling)

FM SIMPLEX — digital (25kHz channeling)

FM REPEATER LINK OUTPUTS (35MHz offset)

2309.000-2314.000
2309.000-2314.000
2314.000-2342.000

WIDEBAND MODES

Data: duplex (35MHz offset)

FM ATV Channel 1: 2328 +/- 14 MHz

2342.000-2344.000
2344.000-2386.000
2344.000-2349.000
2349.000-2358.000
2358.000-2386.000

FM REPEATER LINK INPUTS (35MHz offset)

WIDEBAND MODES

Data: duplex (35MHz offset)

Data: simplex

FM ATV Channel 2: 2372 +/- 14 MHz

2386.000-2400.000
2390.000-2392.000
2392.000-2400.000

GENERAL USE, all modes

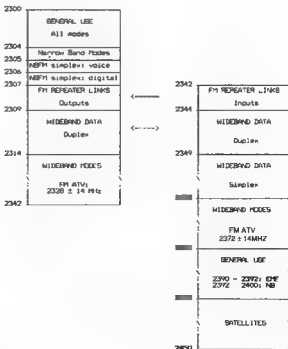
Region 1 EME window

Narrow band modes: segment to be adopted consistent with proposed Region 1/2 NB segment.

2400.000-2450.000

AMATEUR SATELLITES (downlinks)

Proposed Revised 13cm Band



Proposed Revised 9cm Band Plan

3300 000-3446 000	GENERAL USE, all modes
3446.000-3455.900	FM LINKS — wideband voice and data
3455 900-3457 000	NARROW BAND MODES
3455.900-3456.100	EME
3456.100-3456 400	Terrestrial
3456.100	Calling frequency (all mode primary)
3456.200	Calling frequency (all mode secondary)
3456.400-3456 500	Beacons: primary segment
3456.500-3456 600	Beacons: secondary segment
3456.600-3457 000	GENERAL USE, all modes
3457 000-3458 000	FM SIMPLEX — voice (25kHz channeling)
3458 000-3459 000	FM SIMPLEX — digital (25kHz channeling)
3459.000-3462 000	FM LINKS — narrow band voice and data
3462.000-3600 000	GENERAL USE, all modes

Proposed Revised 6cm Band Plan

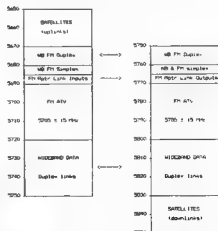
5650-5670	AMATEUR SATELLITES (uplinks)
5670-5760	WIDEBAND MODES
5670-5680	FM duplex (80MHz separation) (Possible future NB segment in the 5670MHz region to conform to Region 1 proposal)
5680-5685	FM simplex
5685-5690	FM REPEATER LINK INPUTS (80MHz separation)
5690-5760	WIDEBAND MODES
5690-5720	FM ATV Channel 1: 5705 +/- 15 MHz
5720-5750	Duplex data links (80MHz separation)
5750-5760	FM duplex (80MHz separation)
5769.900-5761 000	NARROW BAND MODES
5769.900-5760 100	EME
5760.100-5760.400	Terrestrial
5760.100	Calling frequency (all mode primary)
5760.200	Calling frequency (all mode secondary)
5760.400-5760 500	Beacons: primary segment
5760 500-5760 600	Beacons: secondary segment
5760 600-5761 000	GENERAL USE, all modes

5761-5763	FM SIMPLEX narrow band voice
5763-5765	FM SIMPLEX — narrow band digital
5765-5770	FM REPEATER LINK OUTPUTS (80MHz separation)
5770-5830	WIDEBAND MODES
5770-5800	FM ATV Channel 2 5785 +/- 15MHz
5800-5830	Duplex data links (80MHz separation)
5830-5850	AMATEUR SATELLITES (downlinks)

Proposed Revised 3cm Band Plan

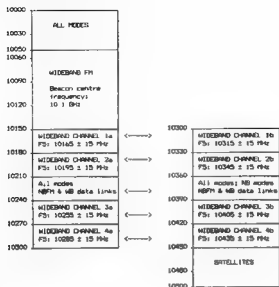
10000-10050	ALL MODES
10050-10150	WIDEBAND FM
10100	Centre frequency for wideband beacons
10150-10210	WIDEBAND MODES
10150-10180	Channel 1a (10165 +/- 15 MHz)
10180-10210	Channel 2a (10195 +/- 15 MHz)
10210-10225	ALL MODES
10225-10230	NBFM REPEATER LINK INPUTS (150MHz separation)
10230-10240	WIDEBAND DATA — duplex (150MHz separation)
10240-10360	WIDEBAND MODES
10240-10270	Channel 3a (10255 +/- 15 MHz)
10270-10300	Channel 4a (10285 +/- 15 MHz)
10300-10330	Channel 1b (10315 +/- 15 MHz)
10330-10360	Channel 2b (10345 +/- 15 MHz)
10360-10368	ALL MODES
10368-10370	NARROW BAND MODES
10368.0 +/- 100 kHz	EME
10368.1-10368.4	Terrestrial
10368.1	Calling frequency (all mode primary)
10368.2	Calling frequency (all mode secondary)
10368.5 +/- 100 kHz	Beacons
10368.6-10370	GENERAL USE, all modes
10370-10372	NBFM SIMPLEX — VOICE
10372-10375	NBFM SIMPLEX — DIGITAL
10375-10380	NBFM REPEATER LINK OUTPUTS (150MHz separation)
10380-10390	WIDEBAND DATA — duplex (150MHz separation)
10390-10450	WIDEBAND MODES
10390-10420	Channel 3b (10405 +/- 15 MHz)
10420-10450	Channel 4b (10435 +/- 15 MHz)
10450-10600	AMATEUR SATELLITES

Proposed Revised 6cm Band Plan



AMATEUR RADIO
HELPING OUR
COMMUNITY.

Proposed Revised 3cm Band Plan



Stolen Equipment

Stolen from Ken Hanby VK4IS, 17 Kig Heights, 14 Queen St, Caloundra, on 27 July from Hooper Education Centre, Wavell Heights: Kenwood TM231A, Ser 0061016 and TM441A, Ser 8010370, and, on 15 August from same address, Ex-CFA Philippe 10-channel, Ser 44882, GME 40-channel AM TX890 Electrophone, Ser 8770556. Contact owner or nearest police station.

Education Notes

To conserve space for this special antenna issue, Brenda Edmonds VK3KT has graciously consented to defer her regular column until November. Thanks Brenda.

RANDOM RADIATORS

RON FISHER VK3OM AND RON COOK VK3AFW

A Wire Signal Squirter for VHF

This is a contribution from Andrew Russell VK5ZUG, who writes as follows (some minor editing has been done).

"The use of long wire antennas at VHF and UHF seems obvious in retrospect as it is easy to make them many wavelengths long. Although not offering the steerability of a beam, a rolled-up loop of copper or aluminium wire takes up little space. It is possible then to get a reasonable antenna into a small Japanese car along with the XYL, rig, feedline, food, luggage, etc when setting off to the seaside for a holiday

I used a length of wire cut to 10 half waves long on 2m (10m approx) fed via 1/4 wavelength stub (52cm approx) to match a 50ohm line. (Ref Fig 1) The feed point XX was adjusted for the best VSWR, starting 1/3 of the way from the shorted end. The length of the

wire can be adjusted to give an improved match. An SWR of 1.2 to 1.5:1 should be easily obtained.

This antenna has gain along the axis of the wire in both directions, with the main lobes getting closer to the wire axis as the wire length is increased. Low-angle radiation can be obtained by sloping the antenna in the direction of interest. Terminating the antenna and using a balanced feed have not been tried, as the increase in performance did not seem worthwhile.

Over the path from Victor Harbour to Mt Gambier and SW Victoria it seemed to work as well as a five-element Yagi used on previous occasions. I hope to make some direct comparisons with a three-element quad in future.

This wire antenna can be readily assembled from available materials for use in field days or in emergency situations."

An interesting antenna, Andrew, which,

when installed horizontally 3m or more above the ground, should work very well indeed. Terminating it might be difficult in the absence of a good metallic ground plane. Thank you for the contribution; please let us know about your quad tests.

More Success with a Windom

Lee VK6HC has written to describe his success with a Windom using 138 feet overall and tapped at 44.4 feet or 32.6 per cent. Why is the Carolina Windom tapped at 38 per cent, he asks? There are several reasons. The best tapping point varies with height above ground and the ground conductivity. Both these variables change the impedance at a current maximum quite considerably so a five per cent variation in tapping point is not too surprising. Further, if the antenna is cut for resonance at a different frequency from that at which matching is done, there will be a variation in the position of the tap for lowest VSWR. Another area for the experimenter to invest some time!

A Failure with a Trapped Dipole

Another VK3 has written in saying that he tried the 18/24MHz trap antenna described in January AR, but the VSWR was about 5:1 in the amateur bands and reached a minimum value well outside the band limits. The antenna was only 3m above the ground and we think this was too low. Further, as indicated earlier, the impedance of an antenna depends on its height above ground, major variations taking place at heights of less than a wavelength. This design of antenna relies on a

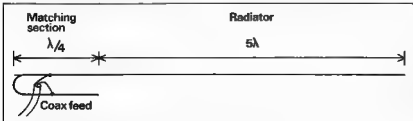


Figure 1 Sketch of a long wire for two metres. The length of the radiator should be a multiple of a half-wavelength

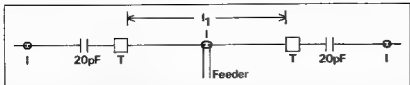


Figure 2 Trap dipole for 18/24 MHz, T = LC trap tuned for 24.9 MHz, I 510m (18' 1") for 24.9 MHz, I = insulator

particular impedance being achieved and so some adjustment of both the inner dipole and the outer legs will be required in many cases before an acceptable VSWR is obtained. Even when the antenna is at a considerable height some adjustment might be required. Intending constructors should obtain a copy of the original article. The author used a height of nine metres in his design.

Some Success with a Trapped Dipole

The same writer built a trap dipole for 18/24 MHz along conventional lines some time back, but found that the tails for resonance on 18 MHz were very short so he inserted about 20 pF in series at four inches (10 cm) past the trap. The tails were then about four feet (1.2 m) long for resonance at 18 MHz. Note that these values are approximate, as the writer was relying on memory when describing the antenna. Ref Fig 2.

Fig 3 shows details of a trap dipole for 18/24 MHz which apparently doesn't require any such modification (W6SAI, Ham Radio Feb 1989).

More on Simple Multi-Band Wire Antennas

The last RR column dealt with the extended double zepp and made reference to the famous G5RV. During the last NFD, one Ron used a 20m (66ft) dipole centre-fed with about 18.8 m (45 ft) of ladder line. In conjunction with a Z-match, this worked very well on all five pre-WARC bands. Whilst being shorter and thus easier to fit into a suburban back yard, its performance is comparable with the two-wire dipoles described last time.

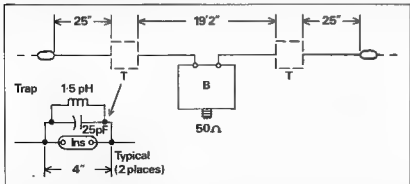


Figure 3 Trap antenna for 18/24 MHz. Trap is mounted across ceramic insulator. Coil consists of 12 3/4 turns, no 20, 5/8 inch diameter, 16 turns/inch (Barker and Williamson 3007)

It has frequently been stated that if the feeder and one half of the dipole has a total electrical length of 26 m (85 ft) then a relatively low VSWR occurs on these bands (See RSGB Handbook and page 157 "HF Antennas For All Locations", L A Moxon). The length comes fairly close to an integer multiple of 22 feet which, as stated in the last instalment RR should be avoided; nevertheless, it is still a reasonable compromise. An ATU is still required for modern transceivers, and one of the popular commercial units with a balun may be used without much risk of the balun giving problems.

Of course, if a balanced tuner such as the Z-match is used, then all bands may be enjoyed and the combined length of the flat top and the feeder are less important. Several dB gain is obtained on frequencies of 14 MHz and above. It is a suitable antenna for city lots and works well in both inverted vee and horizontal configurations. (Note that the other Ron prefers to have the flat top twice as long, but then he has a bit more real estate for such things). The disadvantage of this antenna system compared to multiple dipoles in parallel or a trapped dipole is the appearance of notches in the radiation pattern at the higher frequencies. The advantages are its simplicity and useful gain in particular directions.

Low Cost Weatherproof Gamma Match Capacitor

John Gazard VK6JG writes on his experience with an inexpensive weatherproof capacitor for use in a gamma match.

"The 'Gamma Match' is a very good device for matching a 500hm cable into a Yagi or quad beam antenna. It, however, has one disadvantage in that it needs a variable ca-

pacitor which is adjusted during the initial tuning and then left exposed to the weather. The capacitor can be enclosed in a box, but this is not an easy operation and, in many cases, moisture eventually gets into the box.

This problem can be overcome if a weather-proof fixed capacitor of exactly the required value replaces the variable capacitor. This can be done as follows.

When the gamma match is first installed it is fitted with a variable capacitor that can be easily detached. The match is tuned up by adjusting the gamma bar length and tuning the capacitor until the minimum VSWR is achieved. The capacitor is then removed and measured on a bridge. The capacitance of a piece of double-sided printed circuit board of known area is measured and its capacitance per square centimetre calculated. The required area to obtain the same value as the variable capacitor is then calculated and a piece of board cut slightly oversize. It is then trimmed to the exact capacitance while measuring on the bridge.

Leads are then soldered to the new capacitor and the edges sealed with Araldite. The new capacitor is ready for installation on the match.

A capacitor, made as described, was fitted to a 28MHz quad. It had a capacitance of 31 pF and was 40 mm by 30 mm in size."

Thanks for writing in about this idea, John. The same approach has been used by other amateurs for constructing the capacitor in traps.

Optimum Yagi Design

The designs of DL6WU have been widely accepted as giving optimum or very close to optimum designs for Yagi antennas using seven or more elements. David VK3AUU has devised a formula for designing these Yagis, avoiding the tedious procedure of using the charts given in the original DL6WU articles. (See AR Feb 1988) The 6m band has produced some incredible DX, although much of the time it appears dead. Nothing improves a band like a good antenna, so we include details of several Yagi antennas with a design frequency of 50.1 MHz (See Table 1) Because the element length depends on element diameter, we have given data for a range of diameters. For other diameters, the lengths

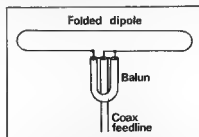


Figure 4 Matching system for DL6WU Yagi. The length of the dipole is given in table 1. It is suggested that the elements be spaced 75 mm apart. The Balun is made of an electrical half-wave, (about 1976 mm long typically at 50.1 MHz)

can be obtained by interpolation or by using David's formula.

Whilst other designs such as log periodics may sport as many elements and offer a wide bandwidth, many exhibit no more than 6dBd gain (6 dB over a dipole). The design here gives about 11 dBd with a useful bandwidth. If the elements pass through a metal boom then they should be lengthened by two-thirds of the boom diameter. Fig 4 shows details of a matching system. While it is possible to remove up to three directors and still get close to 9dBd gain, the matching may suffer and some adjustment in the spacing of the first director is likely to be required.

Well, that's it for this time. Let's hear about your ideas, successes, and even your failures and problems.

73 from me and 73 from him

The two Rons

ar

Table 1 50.1MHz Yagi Design

Both incremental and progressive spacing dimensions are given. The element lengths are for constant diameter tubing.

Element	Spacing		Length			
	inc	prog	6mm dia	9mm dia	12mm dia	16mm dia
Reflector	0	0	3002	2980	2964	2949
Radiator	1436	1436	2920	2880	2851	2823
Dir 1	449	1885	2774	2741	2716	2689
Dir 2	1077	2962	2753	2718	2692	2664
Dir 3	1287	4249	2733	2697	2669	2640
Dir 4	1496	5745	2715	2677	2649	2618
Dir 5	1675	7420	2696	2659	2630	2598
Dir 6	1795	9215	2682	2642	2612	2580
Dir 7	1884	11099	2667	2627	2596	2562

ALARA

JOY COLLIS VK2EBX
PO Box 22 Yssoval 2868

ALARA Contest — Some Changes

Saturday, 10 November is the date of the 1990 ALARA Contest (Rules August 'Amateur Radio').

Two important changes to previous contests should be noted:

Suggested frequencies for easier location of contacts have been changed to bring them more into line with international contest frequencies. These changes should make it easier for DX participants to locate us.

CW Scoring: To encourage novice operators, CW points are now doubled only if at least one operator is Novice class. Other CW contacts are counted at the normal points scoring rate. Two contacts with the same station on each frequency band will still count, being one contact phone and one CW. A maximum of 10 contacts with any one station.

This is not a "YLs only" contest, and we would like to stress that all licensed operators and SWLs are invited to participate. The more the merrier!

VK3 Birthday Luncheon

We had a lovely time at Raed's, celebrating ALARA's 15th birthday — complete with cake provided by Jean Shaw. It was lovely to meet recently joined members Jenny VK3MDR, Erika VK3AEB and Robyn VK3ENX. Raed's OM Ray was suffering from "dishwater" hands by the time we left, so I told him he could have the next day "off" to recuperate. Marlene VK3WQ (used to be VK3FML) sent a card of congratulations from Hervey Bay in VK4. We had 13 YLs and 4 OMs there; we swapped presents and thoroughly enjoyed ourselves, and yes, we did do a bit of conversing hi! (Bron VK3DYF)

Galahs Again!

Apparently the problem of galahs (the feathered variety) causing chaos in aerial systems is fairly widespread in country areas (August 'AR'). I suppose we should not entirely blame the galahs, as they are not the only birds that put us off the air by vandalising our aeriels, but it would seem to me they are the commonest offenders.

One operator was kind enough to ring me and suggest fishing line around the edge of the aerial as a deterrent. The birds don't like getting their feet caught in it. (Who would?) This does seem an interesting solution if raising and lowering aeriels is not too much of a



Robyn Gladwin VK3ENX



Elwyn Bell VK2DLT



Mary Dawkins VK5NMD

problem. City dwellers don't know what they miss'

The OM at this QTH rather unkindly suggested that, having thought the thing through, a speaker at the top of the aerial tower would solve the problem once and for all. When the birds heard the YLs talking, it would be enough to scare any self-respecting galah away for good (his words, definitely not mine) and would be so much less expensive than his previous idea

Here and There

JOTA will once again be held on 20-21 October. Anyone who can assist with this project should contact their local scout or guide organisations, or state co-ordinator.

Joan VK3BJB is once more in the news, an article about her being printed in the 'Melbourne Herald' in July. She was subsequently interviewed on Peter Ackfield's afternoon radio

show (Melbourne ABC). Joan's knowledge of Japanese has proved invaluable on many occasions, and she continues to be very active on Japanese maritime mobile nets.

Mavis VK3KS and Ivor VK3XB must hold something of a record for participating in the RD Contest — they have missed only one year in the past 41.

VK5AIM Steve and XYL Sue (an ALARA member) are very proud of their new grandson.

Dan and I were also pleased to welcome number four granddaughter, Stephanie Anne, in mid-August.

Internationally known net-controller Mary KB9CJL has been on the sick list. Hopefully she will, by this time, be in better health.

Congratulations to Robyn VK3ENX on her accreditation as an examiner.

Silent Keys

We were shocked and saddened to hear

that Richard G4DZI (husband of Diana G4EZI) and Reg VE7BIY (husband of Elizabeth VE7YL) had become silent keys. We were also saddened by the death of Margaret VK6QM.

Margaret, Diana and Elizabeth have been ALARA members for many years.

Our sincere sympathy to Diana, Elizabeth and her family, and the family of Margaret VK6QM

New Members

A warm welcome to the following members: BNG Dawkins VK6NMD, Marion Leiba VK1BN, DX member Lynn Manalo DU1AUJ

Congratulations to Mariene VK3WQ (ex-VK3FML) on the upgrade.

Correction to membership (Sept 'AR'). Elwyn is VK2DLT, not VK3DLT.

73/83 UNTIL NEXT MONTH
JOY AF

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

VK2 QSL Bureau

All members should be aware that earlier this year the Bureau computer expired after lightning spikes were introduced into the local power mains with the most unhappy results. This threw the system, and they had to start from scratch in replacing the data into a new system. This has delayed the delivery of some cards where there was no written backup of instructions. It would be a good idea for all members, unless you did so recently, to advise again just how you would like to receive your incoming cards. Enclose a note with your next outward batch, write the Bureau at PO Box 73, Teralba NSW 2284, tell the Parramatta office or fill out one of the Bureau delivery sheets which can be obtained from either Parramatta or the Bureau.

Advise again your delivery method: Like Parramatta collect, club collect, posted at certain intervals or I do not collect cards. Further information will be given on the VK2WI broadcasts and there will be a further reminder in later notes. Besides, it is a good time to update your request with the Bureau.

Trash and Treasure

The October long weekend falls on the scheduled date so the next T & T will be on Sunday afternoon 7 October in the car park at Parramatta. The last for the year will be on 25 November

Gosford Field Day

The Field Day Committee has advised that the 1991 event will be as usual at the Gosford

Showground on Sunday 17 February, so mark up the calendar now. It is understood that Wagga will not be holding an event this year. (It has been held in November in recent years).

Regional Meetings

Alterations to the Articles of Association were made at the last AGM to change the Conference of Clubs into regional groups. The weekend of 3/4 November has been set aside for the first of these gatherings. Details were posted to clubs early in September, so check out the new procedures at your next meeting.

New Members

During August, membership applications were received from the following, to whom we extend a warm welcome.

M G Bieniek	Asoc	Blaxland
R C Bowden	VK2AX	Spit Junction
J M Burkitt	Asoc	Glenhaven
W M Cowie	VK2XKG	Frenchs Forest
F J Davis	VK2KMS	Raymond Terrace
T M Fong	VK2WAA	Belmore
B S Griffin	Asoc	Lans Cove
I J C Kent	Asoc	Banora Point West
G K T Kwok	VK2GKT	Homeshub West
M Lannoy	Asoc	Kenthurst
L F Miller	VK2XTA	Wamberal
D J Rosemergy	Asoc	Granville
T J Rumble	Asoc	Coogee
A D Sheedy	Asoc	Onkville
P Wilson	Asoc	Goulburn

Help Protect Our Frequencies —

Become an
Intruder Watcher Today!

VK3 NOTES

JIM LINTON VK3PC

TVI Filter Kit

WIA Victoria has become aware that an ever increasing number of its members are experiencing TVI problems. A new membership service has been set up to try to help members in combating this problem. A number of specially made to order filters which can be fitted in the television or VCR antenna line have been obtained. These filters are made for WIA Victoria by Genlex Pty Ltd, and the range will include a high pass filter for 3, 7, 14 and 18 MHz with a notch of 50 dB on those frequencies. Special notch filters with 65dB notch are also available for 21, 28 and 144 MHz. The filter kit will include antenna line "braid breakers".

They will be available to members on a loan basis only. Members are required to pay a deposit when borrowing the filter kit, which will be fully refundable when the filters are returned in the specified loan period. The kit can be borrowed by making arrangement through the secretary/manager, Barry Wilton VK3XV. It must be collected personally from the Divisional Office and will not be available by mail order.

Examinations Service Grows

About 140 candidates sat more than 220 examinations in August throughout Victoria and at two New South Wales venues.

The Parramatta venue in western Sydney was supervised by the WIA NSW Division, with some 35 candidates sitting 56 exams. With the introduction of WIA Victoria examinations in Sydney, there has been considerable interest from clubs in country NSW. They are considering joining the WIA Victoria examinations system by making arrange-

ments through the WIA NSW Division. It was anticipated that half a dozen regional centres in NSW could join the system by early 1991. Our examinations are also supervised in Albury by the Twin Cities Club, which is a member of the WIA Victorian Division. WIA Victoria began conducting exams last February and instantly became the largest single examiner in Australia. It conducts examinations in theory, regulations and telegraphy receiving and sending each quarter in February, May, August and November. Applications to sit the November examinations close on 31 October

5/8 WAVE

JENNIFER WARRINGTON VK6ANW

My thanks to Ray VK5AVR for the following information on the Naracoorte ARC. Ray is their secretary (ph: (087) 82 2034) and the president is Max VK5BMO (whom, I am told, "is the leading light on the technical side of the club activities and mainstay for any repeater problems"). VK5RNC has recently been quieted after a successful working bee 'killed' the very bad noise problem they had. Max and Paul VK5BVR have evolved some theory exam papers on their computers, which they hope to have accredited shortly; they will then be able to offer all types of exams for anyone in the SE or western Victoria. New members are always welcomed at the club (and the 'subs' are only \$10. You don't have to hold a licence — the club is always pleased to help and encourage would-be amateurs. The meetings are held every fourth Friday at 8pm at the Naracoorte Primary School. The president's work phone number is (087) 82 3744.

New Publications Officer

I am pleased to announce that we have a new publications officer. He is Arthur Tanner VK5AAR whom you may remember as a former broadcast officer. You can ring Arthur on

333 0627 or continue to send mail orders via Box 1234, GPO Adelaide, 5001.

Examinations

The WIA has now held its first exams. The fees are as follows: there is no charge to all WIA members, or those who have been doing the WIA course (exams are held at the conclusion of each course). Non-members will be charged \$10 per day.

JOTA — via Satellite

This year VK5 will be joining the other states which have previously been talking to each other via Aussat. I am sure this will make communication easier when HF propagation is bad, and for the 'young ears' who are not as used to listening to sidebands as we are. I believe the satellite book-up will be via one of our repeaters and I hope the 'regulars' will give the 'would be' amateurs a 'fair go'. Let's face it, we need all the new blood we can get.

VK6 NOTES

JOHN HOWLETT VK6ATA

Intruder Watch at September's council meeting, a report from Bob VK6BE listing dozens of pirate intruders on our bands is enough to make you feel the takeover of amateur bands by unlicensed operators using their civil rights and ignoring the rights of other users is only a few years away. Don't pretend they are not there, we have all heard them, some people even comment what is the WIA going to do about it. They are right; what, for instance, is the VK6 council doing about it? As an operator, you know the date, time, frequency and mode of the intruders, so grab the phone and ring Graham VK6RO and ask him what are we going to do about it.

Get your friends to make notes about intruders and ring Graham on 451 3561 and

give him heaps!

Hamfest '90

Hamfest '90' is on again, but in no way is it a tired re-run of last year. New ideas will make it a great day out, so don't miss this annual get-together. Bring something you have made to put in the home-brew display, see the latest gear you can't afford but would like to know about. Bring the card or cheque book for the bargains the retailers save for this event and you could go home with a smile on your face. Load the car with the stuff you bought last year and recycle it. Either sell it yourself from a low-cost car bay or at the bring-and-buy stall and leave yourself free to enjoy the day out. Buy a raffle ticket, enter the quiz, look at the displays, catch up with people you haven't seen for years, enjoy a soft drink and a snack in the NCRG cafe; relax in the pleasant surroundings. Buy books from the WIA bookstall — it stocks \$5,000 worth! What's this packet racket all about? Order some new QSL cards — what a bargain! See how the news broadcast is put together; visit the 40m relay station.

VK6ANC, choose a cake from the cake stall. Look over the WICEN caravan; find out about repeaters, repeater linking and more.

Entrance and car parking are free. The venue is once again Carine College of TAFE, Silica Rd entrance, Carine. Direction signs will be in place; a HELP service will be on channel 4 repeater. Make a note now, Sunday, 28 October, after 10.30am.

Youth AR Group

Previously known as 21 group, the group welcomes any 'youthful' person to join. Their aim is to promote AR to the younger generation, keep administration to a minimum and activity at a maximum. Meetings will be every two months at 1pm on the odd months. A net is also held first Sunday in the month at 1230 UTC on Perth channel 3 and 3.590 MHz.

78 JOHN VK6ATA

QSL's FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

Cocos (Keeling) Is — Part 2

VK1HM

During 1953 the ZC2 prefix was discontinued, changing to VK1, but it is interesting to note that it wasn't until 1955 that the island group became an external territory of the Commonwealth of Australia. At that time the VK1 prefix was shared with Heard Island and Macquarie Island. The January 1954 edition of QST included in its ARRL Countries List

the new prefix, but it appears together with the replaced ZC2 prefix.

The VK1HM QSL shown here was for a QSO dated 1954 with 'SK' Doug Paine VK3FH. Doug's QSL collection of several thousand cards was kindly donated to the WIA collection by his widow, Pat. The sender was Chas Holman, who was employed by DCA as a staff member at the island's airstrip. Cocos Island has always played an important role in aircraft movements. During World War 2, Qantas ran a Catalina service from Perth through

Cocos to what was then Ceylon. The airstrip is sited on West Island. It was constructed in 1945 and, in 1951, the Australian Government acquired and upgraded the strip for Qantas international flights through the island (as a refuelling stop). This service operated from 1952 to 1967. Nowadays the CAA (Civil Aviation Authority), the modern update of DCA, has a staff of flight service unit personnel and radio technicians on the island. A 24-hour flight information service is maintained, CAA officers being on a two-year term transfer. The island is also a refuelling base for RAAF and some USN and RAF aircraft.

The education system on Cocos is based on the Australian pattern, teachers from the West Australian Education Department providing the staff for the schools on the island.

COCOS ISLAND

To Radio VK3FH Confirming Suffix 14 MC Contact

Date 12-7-93 Time 0843 GMT R 5 5 5 T 9

V K I H M

THRU PUF QSL to:

CHAS. HOLMAN c/o Department of Civil Aviation
COCOS ISLAND

1989 PHOTO 1000

ZONE 29

VK9YC



OCEANIA HOUSE
HOME ISLAND
COCOS (KEELING) ISLANDS
INDIAN OCEAN



(There is both a primary and a secondary school on West Island, and a pre-school/primary school on Home Island for Cocos-Malays.)

Philatelists have always been attracted to the stamps of Cocos Island. The subject has been dealt with by Ken and Bett McLachlan in their article "Cocos Keeling — The Forgotten Atoll" which appeared in 'Amateur Radio' in February 1982. An account of some of the operators in the early 1980s is also given. A nice aerial photograph of the islands can be seen in Ken's notes on Cocos Island that appeared also in 'Amateur Radio' in October 1986. The Cocos (Keeling) Postal Service came into being in September 1979, replacing Australia Post. However, the island group does have an individual postcode (6799) it was at this time too, that the Philatelic Bureau was established. Both services are on West Island, as is the island's only broadcasting station, VKW. This is a non-commercial station which is limited to a power of 100 Watts.

VK9YC

This more modern QSL shows the geographical position of the island group. The relative positions of West Island, South Island and Home Island can be clearly seen. The VK9 prefix for Cocos Island came into use during 1956, joining Nauru, Norfolk Island, Papua and TNG, which countries shared that prefix at the time. (Macquarie Island and Heard Island, which had used the VK9 prefix, had already changed this to VK0). In the early 1960s, one of the most popular operators with the VK9 call was Lionel VK9LA, licensed in 1948 as VK6LA. He was a DCA employee and used a home-brew transmitter with that well known receiver, the Drake 2-A. He worked 20 metres with only 80 Watts but made many contacts. Lionel was an excellent QSLer who gave many VKs their first QSO with Cocos Island.

Some DX countries had for an appreciable period been using the first letter of the call-sign suffix as a country indicator (eg VP2D = Dominica, MP4B = Bahrain). This procedure was to be applied to the five VK9 prefix-bearing countries. Thus, from July 1969, the

Cocos Island prefix became specifically VK9Y. However, the older call-signs of existing licensees could be retained. The VK9YC QSL shown is dated April 1982 and is from a resident operator, Cress (G4MBF). The WIA collection contains several QSLs from Australians and others who have operated from this rare spot. The Don Miller expedition (using the call-sign of VK2ADY) operated portable on the island in 1967. Bill VK6SW used VK9YV in 1974. Alex VK6CCT was portable in 1976 and then later used the call VK9CCT. Paul VK6CGR

operated as VK9CGR in 1979, and as VK9YB in 1982. Neil VK6NE was active as VK9YE in 1982, as was Steve VK3OT (as VK9YT). Readers are referred to Steve's interesting account of his 1982 joint DXpedition with Bill K1MM, entitled "Indian Ocean Odyssey", which appeared in 'Amateur Radio Action' Vol 4, No 13 (April 1982). Steve gives an account of the sort of busy schedule kept and the problems facing the DXpeditionist to island locations such as Cocos and Christmas Islands.

Morseword No 43

	1	2	3	4	5	6	7	8	9	10	
1											Across
2											1 Dredge
3											2 Squander
4											3 Cut into cubes
5											4 Residue
6											5 Hand
7											6 Beginning
8											7 Dot
9											8 Seed case
10											9 Animal
											10 Ones here
											Down
											1 Fairy
											2 True
											3 Ranked
											4 Chooks
											5 Prevalent
											6 Secondhand
											7 Immerse
											8 Step
											9 Prefer
											10 Got up

Audrey Ryan © 1990

Solution Page 56

Ann F6CYL operated as VK9YL whilst on a DXpedition in 1978 with Jim Smith who used the call VK9YS. Jim (VK9NS on Norfolk Island) gives a full account of a later DXpedition to Cocos in an article entitled "DXing from Cocos Keeling" appearing in 'Amateur Radio Action' Vol 10 No 4 (August 1987). A very wide range of amateur bands and modes was used, including RTTY. If the reader ever has antenna problems, the reading of this article is sure to relieve any tension. Ken Young operated from the island with VK's special call AX9KY in 1970, as did AX9NXG (in 1989) and AX9YV. Frank VK9NYG was active on 10 metres in the early 1980s, as was Mike VK2YX. So VKs have done well to put Cocos Island on the map.

Although a long way from home, island employees have a range of interests (apart from ham radio) which includes fishing (mostly in the lagoon), snorkelling, shell collecting, surfing, golf (the fairways are on each side of

the airstrip), the 'Cocos Olympics' (competition between West Island and Home Island) and "exciting" hermit crab racing. Talking to some employees who have recently returned to Australia, one is left with the distinct impression that "Life really wasn't meant to be difficult". Due to the high cost of air freight, commodities tend to be more expensive than one might expect in the absence of high import duties. The fact that no income tax is payable is an attractive proposition, but even this is to be changed after July 1991.

No passport is necessary in order to visit the islands, nor is a departure tax payable. Tourism is being encouraged and full accommodation is now (Sept 1990) available on both West and Home Islands, the latter in the historic 100-year-old home of the Clunies-Roes family. Return air fares must be paid for in advance. Interested radio amateurs can seek more information from the Cocos Island

Travel Centre in Dalkeith, WA and from the island's Liaison Office (Dept of the Arts, Sport and Environment, Tourism and Territories) in Perth.

Will You Help?

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated but we especially need commemorative QSLs, special event station QSLs, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139 or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards. **ar**

CLUB CORNER

Ballarat Hamvention

The Ballarat Amateur Radio Group will again hold its annual hamvention on Sunday, 28 October 1990. The venue will be the Sebastopol Football Club Rooms at the Marty Busch Recreation Reserve, seven kilometres south of Ballarat on the road to Colac.

This year's event will be similar to previous successful functions, with something for everyone. Also, a lucky registration prize of \$50.00. The usual trade display has again attracted many exhibitors.

A VHF competition will be run to find out who has the best performing home brew 2m or 70cm antenna. The only rules for the antenna gain measuring competition are that the antenna boom length on both bands must not exceed two metres in length. The antenna producing the highest gain will be the winner. Gain will be measured mid-band.

Mr John Day from Stewart Electronics will give a talk on new developments in the packet radio scene; also, a fully operational Yaesu ham station will be set up by Dick Smith Electronics.

Admission for the day is \$8.00 per person; children under 16 are free. The usual BBQ lunch will be provided, along with afternoon tea. Free tea and coffee will be on tap all day.

The club members will meet at the Red Lion Hotel in Main Road, Ballarat, on Saturday 27 October for a counter tea and chat. Those wishing to attend the counter tea must advise the convenor by 24 October of the number of bookings required, as space will be limited.

Amateurs and stall holders wishing to obtain more details may contact Kevin Hughes VK3WN on (053) 35 5011 (evenings).

VK5 Old Timers' Luncheon

Will be held again this year on Tuesday, 30 October 1990 at

Marion Hotel
Marion Road, MARION

Time: Assemble approximately 12 noon for luncheon at 1pm.

We would appreciate notification of your attendance by 10 October to facilitate catering arrangements.

As last year, it will be pay as you go, with Main Course \$10.00 with tea or coffee.

Please notify George Luxon (VK5RX).
Phone: 272 4025 or Ray Deane (VK5RK).
Phone: 271 5401 or John Allen (VK5UL).
Phone: 344 7465

For those wishing to travel from the City by STA bus, catch bus number 243 from King William Street to Stop 24.

On the same day, the ladies are having a luncheon, and wives/daughters/friends wishing to attend, please contact George Luxon as above. **ar**

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE
NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr A E Sheppard VK2ED,
Mr A S G Fenton VK2VM,
Mr Sydney Sum VK2AVG,
Mr J W Ballinger VK3NK,
Mr John Weir VK3KMW,
Mr F J Christopher VK4NMX,
Mr A J H Wyle VK6BW.

Born 22 June 1916 at Sorell, Tasmania, Tiny matriculated from Hobart State High School and went into his own radio sales and repair business at Sorell. Radio was always Tiny's ambition and hobby.

During war years, Tiny served his country as a radio and electronics instructor based in Melbourne.

During the peace years, Tiny qualified in several spheres as shown below, in case of possible future hard times, an unnecessary labour as his great knowledge of radio took him into the (then) PMG Department as a technician. From there he rose through the ranks to the position of Senior Supervising

Technician in charge at the studios of 7ZL/7ZR in Hobart.

During Tiny's early years he built all his own gear, from VLF to VHF and, as a perfectionist, his equipment was A1 credit to him and admired by all who saw it and QSO'd him with it.

Some of Tiny's early documentation is as follows: ICS certificate in Radio Servicing, 13/9/39, Certificate of Proficiency in Refrigeration Servicing, 16/3/44; BSOC (P#667) 11/6/45; Member of IREE, 1/9/45, AOCP (#2982) 8/9/49 and Member WIA, 1/3/66.

All who came to Tiny for advice or counsel left with a greater knowledge and understanding previously not thought possible.

Tiny is survived by Norma and three family with four grandchildren. Sadly missed by Norma and all who knew him... Vale, Tiny... CUAGN SN!

(TINY DORÉ — VK4KJD)

Verdun (Tiny) Doré VK4ZH (ex VK7JD)

... and, sadly, the first anniversary of this bereavement has passed by... lost to cancer on 6 September 1989.

Sydney Sim VK2AVG

It is with deep regret I announce the passing of Sydney Sim VK2AVG "the quiet man of radio", aged 70, on 17 August 1990. Syd served with the AIF Corps of Signals in WW2, surviving the Burma-Thailand railway, and received the British Empire Medal for clandestine radio construction at Changi Prisoner of War Camp. Post-WW2 Sydney, XYL Doris and family lived on the heights of Como West NSW and spent his working years at the Naval Dockyard Radio Centre Leichhardt, Cockatoo Island and Garden Island, as a communications technician. He retired in 1985 to follow his many interests, including amateur radio and computing. Shortly before his sudden death, he assisted his son construct a light aircraft. Syd is survived by his daughter Jenine, sons Geoffrey and Christopher and their families.

JOHN GRACE VK2ZCG

A S G Fenton VK2VM

I regret to advise you of the passing of Mr A S George Fenton VK2VM, who died in Royal North Shore Hospital on 19 May 1990. He was 74 years of age.

George's interest in radio extended over many years. He served with the RAAF during WW2 and was a proud member of No 3 Squadron RAAF when it departed for the Middle East on 15 July 1940.

After the war he joined the Department of Civil Aviation, and his career continued in the field of radio and aviation. His active interest in amateur radio continued until his death. George will be missed by his squadron and radio friends. Deepest sympathy is extended to his niece Helen and the family.

AL PEARSON VK2CU

John Weir VK3KMW

John died on 25 July 1990, after an illness lasting several months. He led a very active life, and had the philosophy that when you retired, you were retreaded. He wondered how he ever had time to go to work.

His work was in communication engineering; he worked with the research laboratories of the PMG on specialised communications and prototype radar. He joined the RAAF in 1941 as a Radar Officer, and served as Flight Lieutenant until 1947.

Later, he was involved with the experimental laboratory of the Department of Civil Aviation, and flight testing of navigational equipment.

John derived great pleasure from his hobby of amateur radio, and developed great interest in the happenings of his fellow amateurs around the world.

John had his 80th birthday just before his death.

JOYCE WEIR, XYL OF JOHN ar

G-LAND TO BE M-LAND

The United Kingdom's time-honoured G prefix is nearly exhausted, and thoughts are turning to a new prefix system.

The Department of Trade & Industry's intention is to introduce prefixes in the series MA-MZ with the second letter indicating the class of licence.

This would be followed by a single number as a country indicator for England, Scotland, Wales, Northern Ireland, Isle of Man, Jersey, and Guernsey.

The RSGB has also asked that when two Novice licence grades are introduced soon they should have distinctive callsign prefixes and favours using the series 2A-2Z.

ar

SOME THINGS HAVE NO COMPARISON

amateur
radio
action

The magazine for the serious radio operator

AT YOUR NEWSAGENT EVERY MONTH

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOKEE GROUP

October Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST. Covers the major part of NSW and Queensland.

VK SOUTH. Covers southern-NSW, VKS, VKS and VK7

VK WEST. Covers the south-west of West Australia

For each of these regions I have selected six "terminals" to major continental regions of the world. Note that, this month, I have included charts specifically for the Middle East, in lieu of the Mediterranean, because the region is so much in the news of late. The chart will cover the general region, including Greece, Turkey, Israel, Jordan, Saudi Arabia and Egypt.

Predictions for the long path to Europe are included again this month. As 28 MHz is poor, this has been dropped and the 10 MHz band has been included on all the predictions to Europe.

The charts explained

These charts are different to those you see published elsewhere and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organized in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 μ V/metre (dBu). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 μ V/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 μ V/metre, but does not take into account the advantage offered by particular transmission

modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvement. Where conditions warrant it, I have included predictions for the bands below 14 MHz, deleting the upper bands.

More Details About Cycle 22

According to the latest information from IPS Radio & Space Services, Cycle 22 may yet have a few surprises in store.

If the cycle reached its maximum in July last year, then the rise from the minimum in September 1986 looks to be the shortest on record at just 2.8 years.

Large solar cycle peaks, such as Cycle 19, which peaked in 1957, tend to rise to maximum more quickly than do the small cycles. If the current cycle is unusual or special because of its short rise time, then it has probably arrived early.

Alternatively, we may see a further rise in solar activity and the sunspot numbers which, according to IPS, will then bring Cycle 22 into better accord with previous cycles.

The best, as the say, may yet be to come!

UTC MUF DBU FOT 10 14 16 18 21 24 29

1	5.3	+4	12.6	-19	-11	-4	-7	-7
2	9.0	+4	14.6	-18	-7	-1	-6	-6
3	9.4	+9	14.6	-18	-35	-1	-7	-7
4	19.8	+6	16.0	-18	-35	-5	-8	-8
5	26.6	+1	2.7	-17	-35	-10	-5	-5
6	22.1	+4	22.1	-18	-30	-10	-5	-5
7	29.6	+4	22.1	-18	-30	-10	-5	-5
8	27.2	+1	21.8	-18	-35	-14	-7	-7
9	27.2	+3	2.3	-18	-35	-14	-7	-7
10	25.0	+1	19.7	-18	-37	-10	-4	-4
11	23.2	+1	16.3	-18	-38	-2	-3	-3
12	21.4	+4	16.3	-18	-41	-2	-3	-3
13	20.0	+1	15.9	-18	-39	-2	3	4
14	18.0	+5	15.9	-18	-39	-2	3	4
15	10.2	+10	14.4	-18	-44	10	4	-5
16	17.7	+5	12.1	-18	-47	11	4	-7
17	14.6	+12	12.1	-18	-48	10	4	-7
18	15.8	+5	10.5	-18	-43	18	9	-13
19	15.5	+5	10.5	-18	-44	9	-1	-14
20	16.1	+1	11.1	-18	-49	11	11	-13
21	15.6	+1	11.6	-18	-44	4	-2	-15
22	14.9	+5	10.4	-18	-41	8	-7	-18
23	20.7	+5	10.5	-18	-41	-5	-8	-18
24	15.9	+4	21.4	-25	-6	-4	-3	-15

VK EAST - AFRICA

UTC MUF DBU FOT 10 14 16 18 21 24 29

1	17.3	+1	12.0	-32	-6	-3	-5	-12
2	18.6	+3	14.1	-36	-10	-5	-4	-9
3	18.7	+4	14.3	-31	-17	-5	-6	-12
4	22.8	+4	17.4	-26	-10	-5	-5	-5
5	27.9	+3	20.2	-21	-13	-4	-6	-3
6	27.7	+4	19.9	-21	-17	-5	-6	-3
7	27.1	+5	19.3	-21	-17	-5	-6	-5
8	26.1	+5	18.4	-21	-16	-5	-5	-5
9	25.0	+5	18.6	-21	-13	-7	-5	-5
10	23.0	+5	18.0	-21	-10	-6	-6	-6
11	22.0	+5	14.5	-18	-17	-7	-5	-7
12	20.5	+4	12.4	-18	-11	-4	-8	-8
13	17.8	+2	13.1	-15	-5	-2	-4	-11
14	16.6	+2	11.6	-9	2	1	-4	-13
15	16.1	+1	11.2	9	10	4	-4	-16
16	15.7	+3	11.0	-4	16	13	4	-19
17	14.6	+2	10.2	-9	12	3	-5	-24
18	14.9	+1	9.9	-20	13	1	-11	-29
19	14.0	+4	10.1	-22	13	3	-11	-29
20	15.1	+4	14.0	-22	16	5	-6	-21
21	14.8	+3	12.0	-4	30	4	-7	-17
22	14.2	+8	10.1	-9	9	1	-11	-25
23	14.1	+2	10.1	-2	2	-3	-12	-25
24	15.2	+1	12.1	-10	0	-1	-9	-28

VK STH - AFRICA

UTC MUF DBU FOT 14 2 18 21 24 29 25

1	17.3	+5	13.5	8	5	-1	-18
2	19.7	+7	14.1	-1	-2	-2	-9
3	24.2	+1	14.1	-8	2	-1	-7
4	30.6	+1	21.7	-18	-1	4	4
5	31.9	+3	21.9	-27	-9	-1	2
6	31.6	+6	21.9	-31	-1	7	7
7	31.1	+2	25.7	-32	-2	4	0
8	30.9	+1	25.1	-33	-12	-4	0
9	29.9	+1	24.1	-34	-8	1	2
10	28.7	+1	22.9	-27	-9	-2	0
11	27.3	+1	22.3	-18	-4	1	2
12	25.1	+1	21.9	-8	1	2	2
13	23.3	+1	14.4	0	5	3	2
14	20.5	+3	17.0	0	8	0	-3
15	18.1	+2	15.9	17	13	9	-10
16	16.9	+1	12.5	20	14	8	-13
17	17.3	+3	13.4	21	14	1	-16
18	15.0	+7	15.5	22	13	5	-15
19	15.8	+5	13.7	7	12	3	-24
20	15.1	+5	13.0	0	19	9	-20
21	15.1	+5	13.0	0	19	9	-20
22	14.9	+5	12.9	1	12	3	-23
23	14.9	+5	12.9	1	12	3	-23
24	16.6	+6	13.7	12	5	0	-11
25	16.6	+6	13.7	12	5	0	-11

VK WEST - AFRICA

UTC MUF DBU FOT 10 14 2 18 21 24 29

1	15.2	+17	10.3	-20	-12	-13	-16
2	15.2	+13	10.3	-18	-9	-11	-16
3	14.8	+12	9.2	-11	-6	-10	-17
4	13.8	+8	9.7	-23	-7	-12	-21
5	13.5	+5	9.6	-14	2	-5	-25
6	13.5	+5	9.6	-14	2	-5	-25
7	13.5	+5	9.6	-14	2	-5	-25
8	13.5	+5	9.6	-14	2	-5	-25
9	13.5	+5	9.6	-14	2	-5	-25
10	13.5	+5	9.6	-14	2	-5	-25
11	13.5	+5	9.6	-14	2	-5	-25
12	13.5	+5	9.6	-14	2	-5	-25
13	13.5	+5	9.6	-14	2	-5	-25
14	13.5	+5	9.6	-14	2	-5	-25
15	13.5	+5	9.6	-14	2	-5	-25
16	13.5	+5	9.6	-14	2	-5	-25
17	13.5	+5	9.6	-14	2	-5	-25
18	13.5	+5	9.6	-14	2	-5	-25
19	13.5	+5	9.6	-14	2	-5	-25
20	13.5	+5	9.6	-14	2	-5	-25
21	13.5	+5	9.6	-14	2	-5	-25
22	13.5	+5	9.6	-14	2	-5	-25
23	13.5	+5	9.6	-14	2	-5	-25
24	13.5	+5	9.6	-14	2	-5	-25

VK EAST - EUROPE L.P.

UTC MUF DBU FOT 10 14 2 18 21 24 29

1	14.8	+19	10.2	-21	13	13	18
2	14.7	+15	10.7	-16	-11	-12	-19
3	14.2	+12	10.0	-22	-12	-13	-21
4	13.4	+9	9.6	-23	-9	15	-25
5	13.3	+4	9.4	-11	4	4	-29
6	13.3	+4	9.4	-11	4	4	-29
7	13.3	+4	9.4	-11	4	4	-29
8	13.3	+4	9.4	-11	4	4	-29
9	13.3	+4	9.4	-11	4	4	-29
10	13.3	+4	9.4	-11	4	4	-29
11	13.3	+4	9.4	-11	4	4	-29
12	13.3	+4	9.4	-11	4	4	-29
13	13.3	+4	9.4	-11	4	4	-29
14	13.3	+4	9.4	-11	4	4	-29
15	13.3	+4	9.4	-11	4	4	-29
16	13.3	+4	9.4	-11	4	4	-29
17	13.3	+4	9.4	-11	4	4	-29
18	13.3	+4	9.4	-11	4	4	-29
19	13.3	+4	9.4	-11	4	4	-29
20	13.3	+4	9.4	-11	4	4	-29
21	13.3	+4	9.4	-11	4	4	-29
22	13.3	+4	9.4	-11	4	4	-29
23	13.3	+4	9.4	-11	4	4	-29
24	13.3	+4	9.4	-11	4	4	-29

VK STH - EUROPE L.P.

UTC MUF DBU FOT 10 14 2 18 21 24 29

1	14.5	+30	10.3	-3	-19	-13	-20
2	14.4	+26	10.1	-7	-17	-12	-20
3	13.9	+24	9.9	-22	-16	-12	-22
4	13.1	+22	9.5	-41	-15	-7	-25
5	13.7	+19	9.3	-34	-15	-14	-28
6	13.3	+13	9.6	-25	-11	-12	-28
7	13.3	+13	9.6	-25	-11	-12	-28
8	13.3	+13	9.6	-25	-11	-12	-28
9	13.3	+13	9.6	-25	-11	-12	-28
10	13.3	+13	9.6	-25	-11	-12	-28
11	13.3	+13	9.6	-25	-11	-12	-28
12	13.3	+13	9.6	-25	-11	-12	-28
13	13.3	+13	9.6	-25	-11	-12	-28
14	13.3	+13	9.6	-25	-11	-12	-28
15	13.3	+13	9.6	-25	-11	-12	-28
16	13.3	+13	9.6	-25	-11	-12	-28
17	13.3	+13	9.6	-25	-11	-12	-28
18	13.3	+13	9.6	-25	-11	-12	-28
19	13.3	+13	9.6	-25	-11	-12	-28
20	13.3	+13	9.6	-25	-11	-12	-28
21	13.3	+13	9.6	-25	-11	-12	-28
22	13.3	+13	9.6	-25	-11	-12	-28
23	13.3	+13	9.6	-25	-11	-12	-28
24	13.3	+13	9.6	-25	-11	-12	-28

VK WEST - EUROPE L.P.

	USC	WAR	DOG	POET	14	2	18	1	21	2	24	9	28	5
1	26.3	12	19.9		8	15		16	14	30				
2	16.1	13	23.8		8	15		16	14	30				
3	25.7	14	21.3		10	16	17	14	14	30				
4	22.7	14	20.4		11	17	17	14	14	30				
5	24.7	15	20.1		14	20	19	15	9					
6	22.8	17	19.1		23	22	2	2	16					
7	22.7	20	19.0		30	22	4	2	16					
8	23.4	24	17.0		32	27	22	14	8					
9	30.4	22	16.2		32	26	20	11	1					
10	22.7	21	15.2		30	22	16	14	8				-7	
11	18.4	27	14.6		31	24	20	16	5	-7				
12	17.6	24	13.8		30	24	20	14	2	-10				
13	24.7	24	13.1		30	24	20	14	2	-10				
14	22.7	24	12.3		27	18	8	-6	-20					
15	15.0	24	-		23	5	-10	-25	-25					
16	22.7	25	12.8		30	22	14	4	33					
17	13.1	25	10.1		30	8	-9	-21	-40					
18	13.8	24	10.3		31	2	1	18	33					
19	22.7	26	11.1		31	24	8	-35						
20	20.0	25	11.6		17	15	8	5						
21	24.1	25	9.9		17	15	8	5						
22	22.7	24	9.9		17	15	8	5						
23	24.1	24	8.1		11	-7	-7	15	10					
24	22.7	24	8.1		8	16	37	15	11					

[illegible]

DATE	TIME	COND	TEMP	16.2	18.1	21.2	24.9	28.5
1	28.6	0 23.3	-18	-3	2	3	1	
2	28.9	0 24.0	-19	-3	1	3	1	
3	28.4	0 31.4	-18	-3	2	3	0	
4	28.1	1 22.6	-19	-3	2	3	0	
5	27.7	2 32.9	-10	1	4	4	1	
6	27.3	3 22.3	3	6	7	6	2	
7	26.9	4 21.2	7	8	8	8	2	
8	25.8	5 20.0	16	14	14	14	9	2
9	23.6	11 18.5	22	19	15	18	8	-1
10	20.6	12 17.7	14	14	14	14	14	1
11	18.6	4 31.6	14	15	10	11	2	-9
12	19.2	34 15.2	24	16	9	8	3	-25
13	18.3	14 14.3	23	16	10	10	10	-1
14	17.2	15 13.3	22	12	3	3	-10	-25
15	16.6	15 13.3	21	11	1	1	-12	-29
16	15.7	15 12.3	19	8	-2	-2	-14	-34
17	15.2	16 11.8	18	7	-4	-20	-38	
18	14.4	15 11.4	18	6	-8	-25		
19	14.1	10 10.5	17	10	0	-8		
20	13.2	6 11.5	4	0	-8	-91	-36	
21	12.8	2 14.4	-1	1	3	-10	-70	
22	12.4	2 17.9	0	1	7	-10	-74	
23	25.7	1 20.0	-13	-1	2	1	3	

VK EAST - 5TH PACIFIC									
JTC	PLAF	CHS	VTG	14.2	18.1	21.2	24.5	28.5	
1	30.9		2 21.5	+18	-2	4	4	5	
2	32.0		22.0	-30	-2	5	5	5	
3	32.9		23.5	-21	-4	3	5	4	
4	30.7		23.6	-20	-2	4	5	5	
5	34.5		24.9	-17	-1	4	4	5	
6	28.0		24.2	12	7	4	7	5	
7	28.5		25.7	7	-13	7	5	5	
8	28.8		27.4	7	-13	7	11	4	
9	28.9		30.1	4	21	21	18	13	7
10	28.4		31.7	0	22	22	18	13	7
11	28.4		31.9	0	24	22	18	13	7
12	26.3		32.1	0	27	23	18	15	7
13	28.5		32.1	0	27	27	17	9	0
14	22.3		32.7	8	23	21	25	6	-5
15	10.7		32.7	6	26	18	10	0	-21
16	28.4		32.7	7	14	-4	7	5	-13
17	17.7		32.7	8	21	1	1	-13	-29
18	16.3		32.12	6	4	6	-5	-22	-46
19	16.3		32.15	9	4	6	-1	-18	-46
20	16.3		32.18	8	7	7	-20	-30	-39
21	21.0		32.18	14	12			-1	-22
22	28.5		32.20	1	11	11	10	0	0
23	30.5		32.24	7	5	5	9	8	8

WK		STH		—		STH		PACIFIC	
UPC	NO	NO	NO	NO	NO	NO	NO	NO	NO
1	21.9	2	25.9	-9	-21	4	2	5	5
2	22.7	3	26.5	-5	-25	-6	1	4	4
3	21.5	2	26.2	-7	-7	0	3	3	3
4	21.7	2	26.0	-4	-10	0	3	3	3
5	21.6	2	25.3	-3	-21	-5	1	4	3
6	20.1	2	24.7	-10	-13	3	5	4	4
7	26.2	3	27.7	-7	-4	1	5	4	4
8	25.3	1	22.6	-1	7	9	7	8	4
9	26.3	9	21.3	20	20	17	12	6	4
10	26.2	10	19.4	24	23	19	11	7	4
11	26.3	10	18.6	23	20	15	7	-2	4
12	21.9	9	17.4	25	19	12	13	+7	4
13	21.7	11	14.5	27	17	10	9	-12	4
14	19.9	11	13.7	24	16	8	-4	-7	4
15	19.2	11	15.1	23	16	5	-7	-21	4
16	17.7	11	14.7	21	11	-12	-18	-28	4
17	15.5	11	13.3	20	9	-11	-16	-33	4
18	14.6	11	13.2	17	5	-23	-	-	4
19	14.0	9	11.2	17	5	-26	-	-	4
20	14.0	8	11.2	8	7	-20	-20	-18	4
21	22.5	8	15.5	17	12	6	-3	-15	4
22	22.5	4	19.5	5	5	-	-	-1	4
23	23.3	3	42.2	+9	3	6	7	4	4

VK WEST -				STH PACIFIC						
WPC	HWP	DMO	PT	14	20	21	24	9	10	15
1	29.6	4	23.6	-12				3	7	5
2	29.6	4	36.1	-17	-1			4	3	4
3	29.7	3	24.6	-19	-3			3	5	4
4	29.6	2	32.4	-18	-1			3	5	4
5	29.3	2	35.2	-19	-1			3	4	3
6	28.0	2	24.0	-16	-1			3	5	3
7	29.6	3	32.5	-17	-1			3	5	4
8	28.0	0	42.7	-5	5			3	7	4
9	29.7	0	62.1	7	5			11	9	4
10	29.7	1	27.9	-2	1			5	7	4
11	24.0	1	31.9	-6	2			18	11	3
12	23.6	6	11.9	-37	22			16	8	+
13	22.4	4	32.1	-19	22			14	8	+
14	21.7	2	28.7	-21	20			13	3	+
15	20.9	2	32.1	-6	28			11	0	-12
16	20.4	0	14.9	-19	22			14	0	-12
17	18.7	7	11.4	-27	22			13	4	-10
18	17.7	7	11.9	-29	1			10	0	-15
19	16.4	4	11.4	-32	1			10	0	-15
20	15.4	-1	11.9	-5	5			+3	+3	-2
21	16.1	-1	11.2	-4	17			4	9	-20
22	13.8	4	9.1	-5	15			5	5	9
23	14.3	3	6.1	-8	2			7	3	-2

VK		EAST		—		ASIA	
DATE	TIME	1	2	3	4	5	6
1	19.4	-16	11	8	+	12	-18
2	19.8	+18	15	-	-29	-10	-10
3	27.3	-5	11	C	+	10	-5
4	22.0	-2	26	+	+	12	-7
5	11.6	-3	16	3	+	-27	-16
6	30.5	-4	25	6	+	-27	-15
7	10.4	-4	24	9	+	-27	-15
8	26.6	-5	25	7	+	-21	-15
9	28.4	-2	22	6	-16	-14	-6
10	24.4	0	2	+	+	+	+
11	26.6	3	20	3	-8	2	3
12	34.2	6	16	12	5	9	6
13	24.4	9	18	15	1	1	1
14	32.4	4	18	21	10	14	7
15	26.5	12	7	0	23	10	5
16	21.5	1	15	6	23	-13	9
17	18	1	14	6	23	-13	9
18	17.5	4	14	6	23	-13	9
19	17.5	4	14	6	23	-13	9
20	17.5	4	14	6	23	-13	9
21	19.3	-2	18	2	22	10	12
22	19.3	-2	18	2	22	10	12
23	19.3	-2	18	2	22	10	12
24	19.3	-2	18	2	22	10	12
25	19.3	-2	18	2	22	10	12
26	19.3	-2	18	2	22	10	12
27	19.3	-2	18	2	22	10	12
28	19.3	-2	18	2	22	10	12
29	19.3	-2	18	2	22	10	12
30	19.3	-2	18	2	22	10	12

VK		STH		—		ASIA	
UTR	HLF	DOF	EMF	14.2	16.1	21.2	24.9
3	14.3	-10	12.6	-18	-8	-10	-16
2	15.1	-10	12.0	-24	-14	-13	-18
3	20.1	-17	15.4	-34	-17	-12	-11
4	19.7	-8	24.1	-24	-17	-7	-7
5	29.4	-5	24.3	...	-25	-16	-7
6	29.6	-4	32.7	...	-36	-15	-6
7	29.7	-5	22.2	...	-24	-16	-7
8	27.7	-7	21.6	...	-23	-13	-8
9	25.8	-6	21.9	...	-18	-10	-6
10	19.7	-5	18.1	...	-16	-7	-7
11	22.0	-3	17.4	-16	-5	-3	-4
12	20.3	1	16.1	-3	2	0	-5
13	19.7	6	15.5	...	-16	-11	-16
14	14.6	10	14.3	15	10	3	-8
15	17.7	11	12.7	17	8	3	-11
16	17.2	12	12.4	17	7	3	-11
17	15.8	13	12.4	17	7	-3	-18
18	15.1	13	11.7	15	4	-3	-22
19	14.6	17	11.1	17	3	-11	-24
20	14.6	0	12.1	17	7	-3	-17
21	18.1	12	11.6	20	14	7	-4
22	17.7	13	11.6	17	15	3	-6
23	20.2	7	15.4	8	9	6	+15

VK WEST				ASIA					
UTC	WFO	DOY	UT	14.2	18	21	24	28	30
1	16.5	-112.9	7	-2	-2	-7	+14	-28	
2	5	-112.1	1	-13	-9	-12	-19	-30	
3	20.5	+115.4	-22	-10	-10	-7	-19	-15	
4	11.5	-113.4	-1	-13	-13	-6	-1	-1	
5	31.5	-126.6	-5	-16	-8	-7	-2	0	
6	31.5	-124.1	-5	-19	-9	-1	-1	-1	
7	29.5	-125.5	-5	-18	-10	-1	-1	-1	
8	31.5	-125.0	-5	-18	-9	-3	-2	-2	
9	29.5	-124.1	-9	-16	-7	-2	-2	-2	
10	27.5	-123.9	-12	-18	-10	-3	-3	-3	
11	25.5	-121.9	-18	-8	-4	-2	-2	0	
12	25.0	0 20.5	-5	5	5	5	0	0	
13	25.0	0 19.5	-5	5	5	5	0	0	
14	23.0	10 16.2	10	10	10	10	6	+4	
15	22.1	11 17.9	22	18	18	15	-4	-4	
16	21.2	12 16.8	33	23	23	15	-5	-5	
17	20.4	12 16.1	33	17	10	10	-1	-10	
18	19.2	12 15.1	33	5	5	5	-3	-19	
19	18.4	13 14.4	44	11	11	11	-4	-19	
20	17.2	13 13.3	40	11	1	1	-13	-26	
21	16.1	12 12.6	15	8	-2	-2	-16	-32	
22	15.1	13 11.2	30	11	-1	-1	-16	-32	
23	21.0	0 15.9	22	17	11	2	-2	-8	

VK EAST - MIDDLE EAST											
JOC	PLAN	DRM	OFF	14	2	15	21	2	24	28	5
1	28.0		-1	24	3		-18	-9	-4	-3	
2	26	4	-1	21	0	-33	-12	-5	-3	-6	
3	23.0		2	18	9	-19	-6	-2	-2	-5	
4	22.0		6	17	5						
5	22.0		7	16	4						
6	19.0		7	13	4	2	5	3	-7	-10	
7	16.0		8	11	4	11	9	5	-5	-12	
8	16.0		9	10	3	10	6	5	-6	-12	
9	17.0		3	10	16	13	9	17	5	-12	
10	17.0		3	12	15	10	11	3	9	-23	
11	15.0		8	14	12	7	12	10	10	-12	
12	14.0		6	14	11	2	15	4	7	27	
13	14.0		7	16	11	2	16	4	7	-23	
14	14.0		7	16	11	2	16	4	7	-23	
15	20.0		4	15	18	20	16	11	4	5	
16	15.0		8	14	15	9	8	5	3	-12	
17	15.0		5	14	4	7	13	-1	-7	-12	
18	17	2	-12	12		-14	-6	-7	-12	-20	
19	17.0		-22	13		-24	-12	10	-12	-17	
20	17.0		-10	17		-36	-10	10	-12	-17	
21	20	3	-6	31	0		23	12	7	-6	
22	31	5	-2	26	4		-27	-14	-7	-4	
23	31	5	-2	26	4		-27	-14	-7	-4	
24	31	5	-2	26	4		-27	-14	-7	-4	
25	31	5	-2	26	4		-27	-14	-7	-4	
26	31	5	-2	26	4		-27	-14	-7	-4	
27	31	5	-2	26	4		-27	-14	-7	-4	
28	31	5	-2	26	4		-27	-14	-7	-4	
29	31	5	-2	26	4		-27	-14	-7	-4	
30	31	5	-2	26	4		-27	-14	-7	-4	
31	31	5	-2	26	4		-27	-14	-7	-4	
32	31	5	-2	26	4		-27	-14	-7	-4	
33	31	5	-2	26	4		-27	-14	-7	-4	
34	31	5	-2	26	4		-27	-14	-7	-4	
35	31	5	-2	26	4		-27	-14	-7	-4	
36	31	5	-2	26	4		-27	-14	-7	-4	
37	31	5	-2	26	4		-27	-14	-7	-4	
38	31	5	-2	26	4		-27	-14	-7	-4	
39	31	5	-2	26	4		-27	-14	-7	-4	
40	31	5	-2	26	4		-27	-14	-7	-4	
41	31	5	-2	26	4		-27	-14	-7	-4	
42	31	5	-2	26	4		-27	-14	-7	-4	
43	31	5	-2	26	4		-27	-14	-7	-4	
44	31	5	-2	26	4		-27	-14	-7	-4	
45	31	5	-2	26	4		-27	-14	-7	-4	
46	31	5	-2	26	4		-27	-14	-7	-4	
47	31	5	-2	26	4		-27	-14	-7	-4	
48	31	5	-2	26	4		-27	-14	-7	-4	
49	31	5	-2	26	4		-27	-14	-7	-4	
50	31	5	-2	26	4		-27	-14	-7	-4	
51	31	5	-2	26	4		-27	-14	-7	-4	
52	31	5	-2	26	4		-27	-14	-7	-4	
53	31	5	-2	26	4		-27	-14	-7	-4	
54	31	5	-2	26	4		-27	-14	-7	-4	
55	31	5	-2	26	4		-27	-14	-7	-4	
56	31	5	-2	26	4		-27	-14	-7	-4	
57	31	5	-2	26	4		-27	-14	-7	-4	
58	31	5	-2	26	4		-27	-14	-7	-4	
59	31	5	-2	26	4		-27	-14	-7	-4	
60	31	5	-2	26	4		-27	-14	-7	-4	
61	31	5	-2	26	4		-27	-14	-7	-4	
62	31	5	-2	26	4		-27	-14	-7	-4	
63	31	5	-2	26	4		-27	-14	-7	-4	
64	31	5	-2	26	4		-27	-14	-7	-4	
65	31	5	-2	26	4		-27	-14	-7	-4	
66	31	5	-2	26	4		-27	-14	-7	-4	
67	31	5	-2	26	4		-27	-14	-7	-4	
68	31	5	-2	26	4		-27	-14	-7	-4	
69	31	5	-2	26	4		-27	-14	-7	-4	
70	31	5	-2	26	4		-27	-14	-7	-4	
71	31	5	-2	26	4		-27	-14	-7	-4	
72	31	5	-2	26	4		-27	-14	-7	-4	
73	31	5	-2	26	4		-27	-14	-7	-4	
74	31	5	-2	26	4		-27	-14	-7	-4	
75	31	5	-2	26	4		-27	-14	-7	-4	
76	31	5	-2	26	4		-27	-14	-7	-4	
77	31	5	-2	26	4		-27	-14	-7	-4	
78	31	5	-2	26	4		-27	-14	-7	-4	
79	31	5	-2	26	4		-27	-14	-7	-4	
80	31	5	-2	26	4		-27	-14	-7	-4	
81	31	5	-2	26	4		-27	-14	-7	-4	
82	31	5	-2	26	4		-27	-14	-7	-4	
83	31	5	-2	26	4		-27	-14	-7	-4	
84	31	5	-2	26	4		-27	-14	-7	-4	
85	31	5	-2	26	4		-27	-14	-7	-4	
86	31	5	-2	26	4		-27	-14	-7	-4	
87	31	5	-2	26	4		-27	-14	-7	-4	
88	31	5	-2	26	4		-27	-14	-7	-4	
89	31	5	-2	26	4		-27	-14	-7	-4	
90	31	5	-2	26	4		-27	-14	-7	-4	
91	31	5	-2	26	4		-27	-14	-7	-4	
92	31	5	-2	26	4		-27	-14	-7	-4	
93	31	5	-2	26	4		-27	-14	-7	-4	
94	31	5	-2	26	4		-27	-14	-7	-4	
95	31	5	-2	26	4		-27	-14	-7	-4	
96	31	5	-2	26	4		-27	-14	-7	-4	
97	31	5	-2	26	4		-27	-14	-7	-4	
98	31	5	-2	26	4		-27	-14	-7	-4	
99	31	5	-2	26	4		-27	-14	-7	-4	
100	31	5	-2	26	4		-27	-14	-7	-4	

VK		STH		—		MIDDLE		EAST	
UPC	PR	COND	PR	14.2	18.1	21.1	24.9	28.5	
1	29.7		-2 33.7	---	-18	-	4	-3	
2	29.8		-2 22.0	---	-12	-5	-1	-2	
3	25.4		0 20.2	-19	-5	0	0	-3	
4	25.5		2 18.6	-6	1	2	3	-1	
5	22.7		5 17.9	2	7	2	3	2	
6	21.7		7 27.2	41	11	3	8	2	-6
7	20.8		10 24.6	18	14	9	1	1	-1
8	19.8		12 25.5	20	15	9	0	-11	
9	18.5		13 14.4	20	13	6	-4	-17	
10	18.4		14 12.9	19	13	5	-1	-15	
11	16.5		10 21.6	16	5	-5	-21	-18	
12	15.0		14 11.4	16	5	-4	-21	-16	
13	14.8		14 14.4	12	15	1	-1	-16	
14	17.6		10 15.6	15	9	2	-6	-21	
15	16.8		4 13.0	5	1	3	32	-24	
16	15.8		5 12.7	7	-1	-8	-14	-27	
17	16.5		11 14.8	-13	-10	-11	-17	26	
18	16.7		-17 12.6	-16	14	-17	-15	-21	
19	16.1		-14 15.5	-12	-12	-12	-12	-16	
20	24.6		-18 18.8	---	-23	-14	9	-9	
21	28.4		-6 22.1	---	-27	-25	8	-6	
22	11.7		-8 24.4	---	-24	-16	-6	-6	
23	22.0		2 26.0	---	28	8	7	-4	

VK WEST —				MIDDLE EAST			
DATE	WEST	MIDDLE	DATE	WEST	MIDDLE	DATE	WEST
1	20.0	-4 24.0	...	-26	-24	-7	-2
2	20.5	-4 24.5	...	-21	-19	-5	-1
3	23.8	-5 30.0	-36	-35	-8	-5	-5
4	21.5	-6 27.0	-24	-29	-8	-4	-4
5	20.0	-6 24.0	-16	-16	-7	-3	-3
6	18.2	-5 25.5	-6	-1	-1	3	-10
7	19.7	-5 24.0	3	5	2	4	-12
8	19.2	-9 24.0	13	13	1	1	-10
9	17.3	-23 23.5	18	27	5	6	10
10	15.8	-25 22.5	10	10	...	-12	-26
11	17.7	-16 21.5	11	11	...	-10	-10
12	14.8	-37 2.0	...	8	3	-17	-34
13	16.0	-36 24.0	24	17	0	0	-2
14	15.5	-35 25.5	15	17	2	2	-10
15	16.7	-30 24.0	11	10	6	6	-2
16	17.9	-3 23.5	-10	-3	1	-6	-4
17	18.0	-4 24.0	0	0	...	-10	-10
18	16.6	-22 22.0	19	9	-8	-12	-10
19	16.0	-20 22.0	27	13	11	-12	-10
20	16.0	-20 22.0	17	17	1	-1	-10
21	20.0	-14 26.0	5	22	14	10	-11
22	19.0	-5 29.0	6	22	-18	-9	-5
23	19.0	-5 29.0	7	7	...	-9	-5

ADS

TRADE

● **WEATHER FAX** programs for IBM XT/ATs — "RADFAX2" is a high-resolution, software weather fax. Morse & RTTY receiving program. Needs CGA SSBH radio & RADFAX decoder. Also RF-2HC, RF-2GA & RF-2VGA. Same as RADFAX2 but suitable for Hercules. FGA & VGA data respectively. \$25. "SAT-FAX" is a NOAA, Meteor & GMS weather satellite picture-receiving program. Uses FGA or VGA mode. Needs FGA or VGA color monitor and card and WEATHER FAX PC card, \$45. All programs are on 5.25" or 3.5" disks (state which) and documentation. Add \$3 postage. ONLY V from M Delanville, 42 Villers St. New Farm Qld 4005 Ph (07) 358 2785

● **AMIDON FERROMAGNETIC CORES**, for all transmitter and receiver applications. Send CL size SASE for data/price to RJ & US imports. Box 157, Mordville NSW 2223 (no enquiries at office please). 11 Macklin St (Cattery) Agencies at Geoff Wood Electronics, Sydney West Electronics, Albany Electronic Components, ACCT, Truscott's Electronics, Melbourne, 5 Mills, Perth. Assoc TV Service — Hobart.

FOR SALE — ACT

● **KENWOOD TXVR TS535S** with hand-held mike and hand-box, \$695. **KENWOOD MC50** vfo mike, suitable for above unit, \$100. "TEN-TEC" antenna tuner, model 228, built in SWR meter, \$100. Power Transformer 240V/110V, extra heavy duty 10 Amps at 110V. Suitable for workshop or 110V house or heater, \$150. COLLINS S-J line transmitter, \$253 and receiver 75-S-3. Power supply speaker 110/240 transformer, hand mike hand-box. Can be used as transmitter or separately. Leads supplied (does not cover 18MS and 10MS bands), \$755. Frank VIXIE QTHR (08) 296 0815 BH.

FOR SALE — NSW

● **HYGAIN TH30XX tri-band Yagi** benchers 4W balun steel hardware, \$550. **Kenwood PB-50**, \$550. **Hidaka HF** vertical tripped, \$225. **Kenwood 440S** with ATUL V5-1 voice, new in carton, \$1975 (02) 622 6268.

● **30-METRE kit** for Mosley TA-3 tri-band, new, unused, complete, \$200. Identical to 40m kit except for end elements easily added. 2kW spec. **Kenwood VK2AMA QTHR**.

● **YAESU FT700 DM transceiver** YC901 scope/spectrum analyzer FL2100B amplifier FV107 (ext VFO mode for FT701), \$1750 the lot. Jim VK2AK, Arthur (02) 427 1399.

● **YAESU FT101E** with FV101B mint, \$550. **YAESU FT707** with Datong RF clipper mint, \$650. **Onikioscope BWD539 S55** dual trace \$400. **Vinco VK2VC** (02) 713 9535 QTHR.

● **YAESU JVC101** external VFO for FT101, \$55. **CS1 2123** model 300/300 1200V5, \$50. **Mark VK2BAK QTHR** (02) 487 1289. Fax (02) 489 7567.

● **YAESU FT707 100W HF SSB** txv (p/n IF70042), \$650. **Philips FM321** vhf txv (a/n 19-94), \$200. **YAESU FT207R VHF** hand-held, \$175. **Midland 13-95** 50W 10W txv, \$175 (a/n

01200233) power supply 12V 20W, \$20. **Hiduty mag base**, \$30. **VK2BSR** (02) 838 7937.

● **COMMODORE 128D** W German RFI shielded model, good for Amior and IBM. As new, \$575. **Monitor 1901** RGB for above, \$250. **IBM-compat monitor**, 14" paper, while with auto-switching dual graphics display and printer adapter card, \$180. **Keyboard**, latest 101 model, \$75. **VK2WD QTHR** (02) 427 5080.

● **HOMEBREW RGB** linear (2x13) 10-300M sony, no PS plus 12 113 tubes (untested) plus one Elmac double socket with channels for 4CH250B, \$250 the lot. Please waitlands (02) 605 1062 QTHR Tel VK2AWR.

● **ICOM IC-25A 2m FM** transceiver with handbook. Serial No 27233, \$250. **VK2XCM** (02) 98 3281.

● **DECEASED ESTATE SEC** multimeter, 1.0, Three 4" speakers, 35.5s. Ken 2m hand-held simplex 145.5 (p/n 700, 6800, 6900, 7000, \$115. **DSE AM/FM stereo cassette car radio**, \$65. **Hals 40** crankup tower with guy, \$500. **Midland 2m FM** txv simplex 145.86, 148.146 5 (p/n 700, 6850, 6950 7000, \$185. **Microwave meters** 144MHz converter, \$100. **Moranon RC 144MHz converter**, \$60. **NLM 2m 70W amp**, \$190. **Oscar block SWR meter**, \$50. **sona battery charger**, \$12. **Two Qualitronics 2m 9el beams** with matching harness, \$80. **Lightbulb 2-speed unit**, \$30. **1m of beids** 9913 with N connector, \$18. **Talking alarm clock** T-10, \$25. **National cassette recorder**, \$10. **All prices OHQ**. **Randall VK2EFA QTHR** (0505) 5285.

FOR SALE — VIC

● **FL2100Z** linear, includes WARC bands, GC, \$1000. **no.** **Buyer collects**. **Hepburn VK3APQ QTHR** (03) 596 2414.

● **KENWOOD TM2570A 2m FM** receiver with DTMF 5 or 70W output, 23 mms. **Sub base** or mobile. **EC** in box, \$395. **Rob VK3JE** (060) 37 1262 or 584 5737.

● **OSCAR BLOCK SWR/PWR meter**, freq range 3.5 to 30 MHz, 50 or 75 Ohm switch. **GC**, \$40. **Vinco VK3AJQ QTHR** (03) 657 3385 or (03) 872 3503 AH.

● **ICOM 765 HF** transceiver, as new, under warranty. **current model**, number features and FM PSK plus SSB dx mode. **Free delivery**, \$3499. **no.** (0505) 37 1262.

● **ICOM IC4-GAT UHF** for 430-440 MHz FM, new in box. **BP70 battery pack**, 5W RF out. **leather case** workshop manual, \$400. **ICOM IC4-GAT VHF** for 144-148 MHz FM 130-173 MHz. **BP6 battery pack**, 7W RF out. **DC-DC converter**, **DC cable**, **144MHz speaker**, **mike**, **leather case**, new in box, \$450. **Len VK3DLM** (0505) 55 1659.

● **YAESU FT101E HF** transceiver in VGC. Includes CW filter, \$450. **Ben VK3TU** (052) 78 2374 AH.

● **FL2100Z** linear WARC bands. **GC**, **National video camera**, **carry case**, **heaps of extras**, **EC**. **VHF marine radio** with new **tornglass whip** ant. **GC**. **VK3VPR**, 15 Wood St, Rosedale 3847.

● **YAESU FT25R 6m all mode** txv. Asking \$500. **QTHR**

VK5BRO (03) 895 2093

● **ICOM IC32AT** hand-held dual band 2m-70cm SW charger. **Callon**, **manual**, **new**, **cor** \$565. **no.** **Andy VK3UJ QTHR** (03) 735 3335.

● **TANDY Realistic Pro 2022**, 200 ch scanner, as new 3 mths old. **Original** **packing**. **Very little use**. **Sell** \$300. **no.** **Dave L30259 DTHR** (03) 370 3589.

● **IC202 2m SSB** txv. **Not working**. **IC502A 6m SSB** txv. **VGO VK3YNS QTHR**.

● **KENWOOD SK220** Mon Scope c/w all leads, **manual**, **mint**. **cond**, \$350. **Kenwood AT250** auto ATU 9 mHz, **new** **on** **leads**, **manual**, **mint**. **cond**. **Ken VK3MW QTHR** (03) 580 5178 AH. (03) 522 1478 BH.

● **KENWOOD TR2400 2m FM** hand-held txv with charger, \$850. **no.** **Paul VK3YVF** (03) 758 4117. **Serial No** 0119107.

● **YAESU FT208** 144-148MHz hand-held txv. Includes mic, battery and charger. \$249. **Realistic Pro202** scanner, **EC**, includes **battery**, **charger** and **cable**. \$249. **Norm VK3ZEP** (03) 782 1115 or (018) 35 7844.

● **DSE 9EL 2m YAGI** VK5297 \$50. **DSE motor D5003** complete, \$60. **Sealed**, **2m ant** (S17 JIM) D4211 \$19. **Syd VK3CEP** (0505) 85 2170. **Rye**.

● **HYGAIN TH30XX TRIBAND HF YAGI**, **EC**, \$350. **CHQ**. **Alan VK3UJ QTHR** (0502) 822 2394.

● **YAESU FT107E** power supply, 20 Amps **cond**, **rating**. **As new** **condition**. **CW manual**, etc. \$200. **Ken VK3MW QTHR** (03) 580 5278, BH (03) 522 1475.

FOR SALE — QUEENSLAND

● **ANTENNA** C336 with BK80 balun 3-band 8-element, same as B6, \$300. **Wave rotator**, model DR7502a with control unit and 80' multi-core cable, \$300. **no.** **VK4GB QTHR** (07) 398 1836.

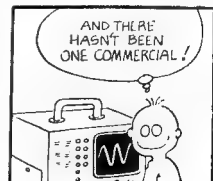
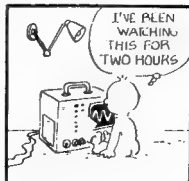
● **FT-50R** Yaesu, 6m all-mode txv, **EC**, \$495. **no.** **Antenna tuner** Entor AT-300A 1.8-30MHz cross needle, dummy load, balun. **Matches anything**, \$289. **Geoff VK4CET** (077) 23 1453.

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● **HAND** **Kenwood TR2400**, **new**, **unused**, \$350 the pair. **10 program-** **table memories**, **many other features**, includes **speaker/mike** and **base station** **charger** **w/mike**. **GC**. **Manuals**, **Original**, **cartons**, \$355. **John VK4CZ QTHR** (077) 61 3286.

● **ICOM IC290**, linear amp, \$2100. **ICOM AT-500** auto tuner, \$900. **ICOM 720-A** transceiver, PS-15 power supply and SP-3 speaker, \$1300. **ICOM M-1** VHF linear for handhelds one in 10 out, \$150. **The above units** have had little use and are in mint condition. **KENWOOD SM-220** station monitor, needs minor adjustment, \$290. **ICOM BC-30** fast charger, \$100. **ICOM IC-2A**

— ST. PIPS



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Solution to Morseword No 43

	1	2	3	4	5	6	7	8	9	10
1
2
3
4
5
6
7
8
9
10

Across: 1 silt; 2 waste; 3 dice; 4 silt; 5 fist; 6 onset; 7 bip; 8 pod; 9 bear; 10 these.

Down: 1 fay; 2 real 3 rated; 4 hens; 5 rifle; 6 used; 7 steep; 8 tread; 9 like; 10 rose.

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... gives you **full** 1.8-30 MHz coverage, a **peak reading** (and average) Cross-Needle meter, built-in **dummy load**, antenna switch and balun ... all covered by a **full one year unconditional guarantee** ... for only

MFJ-949D

\$324.00

PLUS Freight \$10 Within Australia
All Prices Include 20% Sales Tax

- **Peak reading meter**
- **Built-in dummy load**
- **Covers 1.8 to 30 MHz**
- **1 full year guarantee**

You won't find all these useful features in any other 300 watt tuner - not even at twice the price.

New peak reading meter

The new **peak** and average reading Cross-Needle meter in the MFJ-949D shows you SWR, forward and reflected power - all in a single glance.

Without a **peak reading** wattmeter you just won't be able to tell if your rig is putting out all the peak SSB power it's designed for. Don't be without one if you want top performance.

Built-in dummy load

A built-in 300 watt 50 ohm dummy load makes tuning up your rig sooooo easy. How do you tune up your rig without one?

An external dummy load will cost you about \$30 more - plus it takes up valuable space at your operating position and requires another cable.

Full 1.8 to 30 MHz coverage

The MFJ-949D gives you **full** 1.8-30 MHz coverage.

Make sure the tuner you're considering covers all the HF bands.

Don't get a tuner that keeps you from operating all the frequencies you've worked for - now or in the future.

Plus more ...

You get a versatile 6-position antenna switch and a 4:1 balun for balanced lines.

You can run up to 300 watts PEP and tune out SWR on coax, balanced lines or random wires.

Unconditional Guarantee

You get a **full one year unconditional guarantee**. That means we will repair or replace your MFJ tuner (at our option) **no matter what** for a full year.

Others give you a 90 day **limited** warranty. What do you do after 90 days? Or before 90 days when they say, "Sorry, it's your fault!"

What's really important?

Precise control for minimum SWR

What's really important is your tuner's ability to get your SWR down to a minimum - and the MFJ-949D gives you more precise control over SWR than any tuner that uses two tapped inductors.

Why? Because the two **continuously** variable capacitors in the MFJ-949D give you **infinitely** more positions than the limited number on two switched coils.

This gives you the precise control you need to get minimum SWR and maximum power into your antenna.

After all, isn't that why you need a tuner?

High efficiency and a compact size: performance is most important

The MFJ-949D uses a **single** airwound coil. Using only one inductor takes up a minimum of space and there's no mutual coupling problems.

The excellent form factor of the short fat coil gives you highest Q. Plus you get plenty of inductance that gives you a much wider matching range than other designs.

This results in a highly efficient tuner that puts maximum power into your antenna and a compact 10 x 3 x 7 inch size that complements your rig and fits right into your station.

Competing tuners using two tapped coils require a large cabinet - not just to house the coils but also to help reduce detrimental coupling between the inductors. The result? A tuner that's **bigger** than your radio.

Your very best value

The MFJ-949D gives you your very best value, first-rate performance, proven reliability and the best guarantee in ham radio ... all from the **most trusted** name in antenna tuners. Don't settle for less. Get yours today!

MFJ's 1500 Watt Tuner

MFJ-962C

\$499

Freight \$10
Within Australia



For a few extra dollars the MFJ-962C lets you use your barefoot rig now and have the capacity to add a 1.5 KW PEP linear amplifier later. It covers 1.8 to 30 MHz.

You get MFJ's new **peak** and average reading Cross-Needle SWR/Wattmeter.

You also get a 6-position antenna switch and a teflon wound balun with ceramic feed-thru insulators for balanced lines. Measures just 10 1/2 x 4 1/2 x 14 7/8 inches.

MFJ builds every tuner cabinet from scratch using the latest high-speed computer controlled punch presses.

MFJ manufactures, assembles and tests every PC board that goes into MFJ tuners.

Instruction manuals and other materials are printed in MFJ's print shop.

MFJ tuners go directly from our factory to your dealer. We're not just an importer adding profits, tariffs and import charges.

With MFJ's efficient in-house manufacturing and straight to your dealer distribution you get the most tuner for your money.

WHY CHOOSE AN MFJ TUNER?

Hard-earned Reputation: There's just no shortcut. MFJ is a name you can trust - more hams trust MFJ tuners throughout the world than all other tuners combined.

Proven Reliability: MFJ has made more tuners for more years than anyone else - with MFJ tuners you get a highly-developed product with proven reliability.

First-rate Performance: MFJ tuners have earned their reputation for being able to match just about anything - anywhere.

One full year unconditional guarantee: That means we will repair or replace your tuner (at our option) **no matter what** for a full year.

Continuing Service: MFJ Customer Service Technicians are available to help you keep your MFJ tuner performing flawlessly - no matter how long you have it -

Your very best value: MFJ tuners give you the most for your money. Not only do you get a **proven** tuner at the lowest cost - you also get a **one year unconditional guarantee** and **continuing service**. That's how MFJ became the world's leading tuner manufacturer - by giving you your very best value.

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